

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The Mining Journal is Registered at the General Post Office as a Newspaper and for Transmission Abroad.]

No. 2343.—VOL. L.

LONDON, SATURDAY, JULY 17, 1880.

[WITH SUPPLEMENT.] {PRICE SIXPENCE. PER ANNUM, BY POST, £1 4s.

R. JAMES H. CROFTS, STOCK AND SHARE BROKER,
AND MINING SHARE DEALER,
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.
ESTABLISHED 1842.

Business transacted in all descriptions of MINING Stocks and Shares (British and Foreign), Consols, Bonds (Foreign and Colonial), Railways, Insurance, Assurance, Telegraph, Tramway, Shipping, Canal, Gas, and Dock Shares, and all Miscellaneous Shares.

Business negotiated in Stocks and Shares not having a general market. Every Friday a general and reliable List issued (a copy of which will be forwarded regularly on application), containing rising prices of the week.

MINES INSPECTED.
WORKERS: CITY BANK, LONDON—SOUTH CORNWALL BANK, ST. AUSTELL.

SPECIAL DEALINGS in the following, or part:—
250 Javali, 4s. 9d.
30 Ruby, £7 10s.
25 Richmond, £15 13s. 9d.
20 Roman Gravel, £10 1/2.
30 S. Indian Gold, £1 16 3/4.
10 Santa Barbara, £2 1/2.
10 So. Condurow, £10 1/2.
20 South Darren, £2 18 9.
25 So. E. Wynad, £2 7 6.
50 S. Penstruthal, 10s.
10 Tankerville, £4 1/2.
40 Van and Glyn, 10s.
30 West Phoenix, £2 2 6.
30 Wheel Crebor, £5 12 6.
75 Pestarens, 5s. 3d.

SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.

RAILWAYS—SPECIAL BUSINESS.
FOREIGN BONDS—SPECIAL BUSINESS.
Fortnightly accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.
ESTABLISHED 1842.

R. W. H. BUMPUS, STOCK AND SHARE BROKER,
AND MINING SHARE DEALER,
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ESTABLISHED 1867.

Business transacted in STOCK EXCHANGE SECURITIES AND MISCELLANEOUS SHARES of every description.
RAILWAYS, BANKS, FOREIGN AND COLONIAL BONDS.
TRAMWAYS, TELEGRAPHS, and all the LEADING INVESTMENTS.
Accounts opened for the Fortnightly Settlement.
A List of Investments free on application.

BUMPUS has SPECIAL BUSINESS in the undermentioned:—
5 East Pool, 50 Prince of Wales, 22s.
40 E. Roman Gravel, 15s.
20 Polrose, £2.
25 East Lavell, 100 Port Phillip, 9s. 9d.
100 Flagstaff, 16s.
30 Panullicillo, £4 1/2.
30 Frongoch, £3 1/2.
50 Pen-yr-Orsedd, 10s.
50 Frontino, £3 1/2.
100 Glenrock, 28s. 6d.
10 Roman Gravel, £10 1/2.
5 Great Laxey, £19 1/2.
15 Ruby, £7 1/2.
150 Glenroy, 18s.
100 South Indian, 10s.
25 Herodsfoot, 5 Tincroft, £18 1/2.
60 Hingston, 21s.
40 Leadhills, 5 Van, £19 1/2.
5 Minera, 25 Wheel Sisters, £2 1/2.
25 Marke Valley, 75 Wheel Jewell, 16s. 6d.
50 New Quebrada, £4 1/2.
50 West Phoenix, £2 1/2.
100 Nouveau Monde, 17s.
25 West Holway, 25s.
80 Parys Copper, 23s. 9d.
25 Wheel Grenville, £2 16s. 3d.
100 Nouveau Monde, 17s.
25 West Holway, 25s.
80 Parys Copper, 23s. 9d.
25 Wheel Grenville, £2 16s. 3d.

BUMPUS devotes special attention to these Securities, and is in a position to give reliable information and advice to intending investors and others.
WHEEL GRENVILLE shares strongly recommended for an important rise in early dividends.

WILLIAM HENRY BUMPUS, SWORN BROKER.
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ESTABLISHED 1867.

BERNARD R. KIRK, 5, BIRCHIN LANE,
LONDON, E.C.
FORTNIGHTLY ACCOUNTS opened, on receipt of the usual "cover," in ways Home and Foreign, Mining Shares, Foreign Bonds, and certain Miscellaneous Securities.

THE WEEK.—A SEPARATE EDITION from that which appears in the Mining Journal is published every Wednesday evening, containing "Notes and Prices on the Stock Markets," with Closing Prices. May be had on application.
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MESSRS. ENDEAN AND CO., STOCK AND SHARE DEALERS,
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BRITISH AND FOREIGN MONTHLY MINING NEWS
—STOCK AND SHARE INVESTMENT NOTES—MINES,
MINERALS, AND METAL MARKETS—SHARE LIST.
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Derwent, £2 1/2.
Devon Gt. Cons., £12 1/2.
Dolcoath, £5 1/2.
Don Pedro, 9s.
East Caradon, £1 3s. 9d.
East Crebor, 17s. 6d.
East Pool, £3 1/2.
E. Roman Gravel, 14s.
East Van, £1 1/2.
Flagstaff, 13s. 9d.
Glenlake, (Clit.), £4 1/2.
Glenrock, 27s. 6d.
Herodsfoot, £3 11s. 6d.
Hingston Down 18s.
Killfret, 7s. 6d.
Leadhills, £2 1/2.
Marke Valley, £2 1/2.
New Cook's Kit., £7 1/2.
North Penstruthal, 10s.
Nouveau Monde, 16s. 6d.
N. Zeal. Kapanga, 16s. 6d.
Pandora, 19s.
Parys Corpora., 21s. 6d.
Prince of Wales, 22s. 6d.
Roman Gravel, 10s.
Ruby, £7 1/2.
South Darren, £2 1/2.
South Frances, £13 1/2.
Tincroft, £18 1/2.
Van, 10s.
West Caradon, £2 1/2.
West Chiverton, 10s.
West Devon, £3.
West Frances, 14s.
Wt. Glenlake (Clit.), £4 1/2.
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Wheel Grenville, £2 1/2.
Wheel Kitty, 10s.
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Mr. REYNOLDS direct the attention of his correspondents to the accuracy of his anticipations respecting the Tin Market, and believes that a permanent improvement has set in, and that higher prices will be reached.

Mr. REYNOLDS considers a great rise in many of the principal Tin Mines as inevitable, and is himself prepared to buy largely for his correspondents.
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25 Bedford United, 29s.
40 Birdseye, 20s.
25 Cambrin, 32s. 6d.
20 Carnarvon, 17s. 6d.
40 Colorado, 27s. 6d.
50 Consolidated, 12s. 6d.
15 Devon Consols, £12 1/2.
60 Don Pedro, 11s. 3d.
15 East Caradon, 23s.
25 East Van, £2 6s. 6d.
50 Flagstaff, 16s. 3d.
20 Frontino, £2 6s. 3d.
20 Gunnislake (Clitters), £4 7s. 6d.
20 Ruby Silver, £7 1/2.
30 So. D'Eresby, 35s.
30 So. Frances, £14 17s. 6d.
23 S. Indian Gold, £1 17 6.
15 Tankerville, £4 1/2.
100 Van & Glyn United, 5 Van, £19 1/2.
50 Victoria (London), 20 West Devon, £3 1/2.
50 West Kitty, 30s.
100 Wheel Crebor, £5 17 6.
10 Wt. Grenville, £2 1/2.
25 W. Gunnislake (Clit.), 25s.
75 Wheel Jewell, 16s. 3d.

BWLCH UNITED.—Some splendid rocks of Silver-Lead Ore from these mines may be seen at this office.

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Offers wanted for 100 Pant-y-Mwyn, 50 British Silver-Lead, and 20 FLAS-DDU AND PARK. Rich ore discovered in each. When a little more developed will enter the Dividend List. Also, 10 New Wye Valley shares.

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SAFE DIVIDEND INVESTMENTS PAYING 4 TO 6 AND 10 PER CENT. PER ANNUM ON PRESENT OUTLAY.

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The JULY EDITION (post free).

SHOULD BE CONSULTED BY INVESTORS AND SHAREHOLDERS.

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Tramway, Telegraph Shares. Shipping, Dock Shares.
Municipal Bonds. Miscellaneous Shares, &c., &c.

HENRY GOULD SHARP, STOCK AND SHARE BROKER,
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BANKERS: LONDON AND WESTMINSTER, Lothbury, London, E.C.

A SAFE INVESTMENT FOR £100 or £1000 TO £10,000.

SPECIALY RECOMMENDED TO CAPITALISTS AND INVESTORS.

The MONA is the richest and most valuable mining property in the United Kingdom. Millions have been paid in profits. The mine produces copper, lead, silver, bluestone, ochre. Shares are a safe investment, and will become immensely profitable, and large continuous dividends will be paid. I advise the immediate purchase.

N.B.—Shares are scarce: 4000 of them are held in Angleses for investment. They are likely to go to £30 per share, and pay £4 per share yearly.

THE MONA MINE (LIMITED),
NEAR AMLWCH, ANGLESEA.

In 8000 Shares of £5 each. Fully paid. Price £16 per share (cum 10s. dividend).

This grand mineral property occupies the eastern portion of the hill known as Parys Mountain, which has for more than a century been celebrated as containing one of the largest deposits of copper ore ever discovered in the British Isles.

It would be difficult to forecast the future of this remarkable undertaking. The proprietors are sanguine that the profits of the past will be reproduced by history repeating itself in the future. The direct objects aimed at would be the opening up the large deposits in the discovery of plumbiferous blende; the opening up of copper deposits at Sidney shaft, Cairns' shaft, Charlotte shaft, Henry's shaft, and others; the extension of the ochre or oxide trade; and the smelting to a regular basis the ores raised; and otherwise to carry out the objects of the undertaking, which will become one of the most profitable mining companies.

Mona Mine, 17th June, 1880.

I visited this mine on the 17th and 18th of June (last month), and was astonished at the gigantic workings. I have seen the Van, Dolcoath, Devon Great Consols, but none of them will compare with Mona. Van has paid £351,000 in dividends, and shares in 15,000 rose to £84 each. Dolcoath has paid £500,753 in dividends, and shares have been £96 each. Devon Great Consols has paid £1,206,248 in dividends, and shares were once £800 each, with £1 only paid up. Mona has far exceeded all these mines put together, having paid several millions of pounds in profits. I say now, without fear of contradiction, Mona has not its equal at the present time in the United Kingdom. The mine was worked in the time of the Romans; it has been working the past 112 years without a stop, and during this time millions of pounds have been given in profits. It is immensely rich. There are 270 hands employed on the Mona Mine.

The present agent, Capt. William Hughes, has been there for 20 years; he knows every corner of the mine, and is a thoroughly practical miner.

They can dress and sell 4000 tons of ochres yearly; this will be doubled. They can raise and sell 1500 tons of bluestone yearly; this will be doubled in time—in fact, the supply is unlimited. They have also an unlimited supply of gas purifying oxide. When the new engine gets to work they will raise and sell 300 to 400 tons of copper ore monthly from Cairns' shaft. They are now raising 250 tons monthly from Sidney shaft; this will be increased. Next year they will raise 600 or 700 tons of copper ore monthly from Cairns' and Sidney shafts alone, and I quite believe that in 1882 they will see 1000 tons per month of copper ore. They have some 20 shafts on the mine, which is about one mile square.

NORTH PART OF MINE AS FOLLOWS:—

Henry's shaft, 30 fathoms deep.	Cairns' shaft, 80 fathoms deep.
Charlotte's " 55 " "	Sidney's " 55 " "
Carregdoli's " 30 " "	Leon's " 30 " "
Beer's " 30 " "	Tidy's " 30 " "
Marquis's " 90 " "	Pearl's " 100 " "
Trewek's " 30 " "	

There are several other small shafts.
From Cairns' shaft 300 and 400 tons of copper were raised monthly, and will be again after the engine goes to work, and between these two shafts there is a run of 230 fathoms of ground no doubt as rich.

I would here remark Pearl's shaft was rich 90 fathoms deep, other shafts having same run of ore ground will no doubt prove as rich to the same depth and below it.

SOUTH PART OF MINE AS FOLLOWS:—

Viceroys' shaft, 65 fathoms deep.	Sanderson's shaft, 30 fathoms deep.
Blackrock's " 30 " "	Clay's " 30 " "
Calcein's " 30 " "	Bluestone " 30 " "
Old Bluestone " 30 " "	

The same remarks will apply to these shafts in sinking below their present depths.

The best Bluestone sells as high as £3 per ton. Average it at £2 per ton.

Carregdoli's shaft, high as £2 10s. per ton. Average it at £1 15s. per ton.

The regulus sells as high as £37 per ton; now worth £30 per ton. This depends upon the price of copper.

Mona is a magnificent mining property, second to none, and equal to any three mines in the United Kingdom.

I went to this property again on Monday, 5th July, and after going over the Mine I visited the large Smelting-works, where I saw £3000 worth of regulus ready for sale.

N.B.—I saw the whole of the Works. I look upon the Mine as an "Investment" which will last and pay well for a generation to come. It has not its equal in this country. I strongly advise the purchase of shares at £16 per share for a rise of 100 per cent., and for continuous dividends. My statements are "facts" which anyone may verify on going to the property. (Two miles from Amlwch, in Anglesea.)

EXTRACT FROM STATEMENT OF GENERAL MEETING, 13th MAY, 1880.

The Chairman stated that, although the company had been working only four months, they had sold of regulus 25 tons 15 cwt. 1 qr., realising £953; bluestone, 1833 tons, realising £2500; ochre, 489 tons, realising £868 9s. 8d.; pyrites, 119 tons, realising £53 18s. 1d.; solder realising £37 6s. 8d.—in all, £4422 12s. 5d. On hand and in stock, the bulk of which is sold, but waiting shipment—Copper ore, 400 tons, put down at £1000 (more likely to realise £1400); regulus, 30 tons, put down at £2700 (within the mark); ochre, 300 tons, put down at £1200; bluestone, 900 tons, £2900. Total £5900, keeping well within the mark. That is £10,223. Well, I will astonish you. That has all been realised at a cost of £3223—leaving a net profit of £7000. These facts require no flowery language, for a more satisfactory statement was never put before shareholders.

DIVIDEND MEETING.—At a meeting of the directors of the Mona Mine, held on Wednesday, the 14th July, 1880, an interim dividend of 10s. per share was declared from profits made, payable the 1st August. All shares bought this month (July) secure this dividend.

F.S.—Another very important point is "the North Discovery lode," which in Parys Mountain gave £500,000 profit many years ago. This lode is worked up to the boundary in the Parys Mine, but not yet touched in the Mona, and it goes right through their property.

Dividends of £2 per share yearly may be relied upon, and at £16 per share it will give £12 10s. per cent. per annum. A good investment. I look for £4 per share yearly, and believe shares will rise to £30 per share in 1882.

I ADVISE THE PURCHASE OF SHARES IN THE FOLLOWING MINES:—

SOUTH DARREN..... £2 15 0 to 3 0 0	DERWENT..... £2 7 6 to 2 12 6
HERODSFOOT..... 3 10 0 .. 3 18 0	WEST PHENIX..... 2 0 0 .. 2 5 0
ROM. GRAVELS..... 10 0 0 .. 10 5 0	WHEEL JEWELL 0 15 0 .. 0 17 6
WHEEL JANE..... 3 15 0 .. 4 0 0	EAST CARADON..... 1 0 0 .. 1 5 0

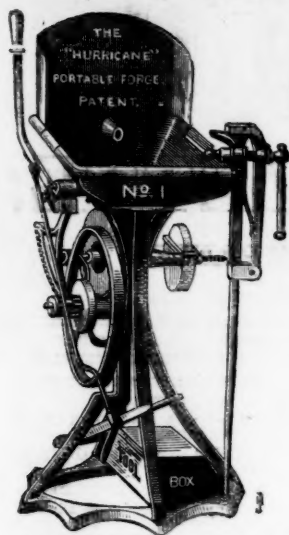
SOUTH DARREN.—The next dividend will be 2s. per share, making 6s. per share this year.

HERODSFOOT.—This mine is making profits, and opening up rich. Only 3000 shares. Only £1 5s. per share called up. No mine in this Journal with so small a capital can show such results in so short a time; £5000 worth of silver-lead ore sold in 18 months.

WHEEL JANE.—They are raising 60 tons of tin four-monthly. At present price of tin showing over £2000 yearly in profits. Dividends not far off. Only 2048 shares. The cheapest tin shares in Cornwall.

HENRY GOULD SHARP, STOCK AND SHARE BROKER,
42, POULTRY, LONDON, E.C.—ESTABLISHED 1852.
BANKERS: LONDON AND WESTMINSTER, Lothbury, London, E.C.

A COMPLETE, PORTABLE, AND EFFICIENT SMITHY FOR £7 7s.



THE "HURRICANE" PORTABLE FORGE

(HARDINGE'S PATENT).

A Complete and Portable Smithy, possessing a Powerful Blast, a Forge, a Hearth, a Vice, an Anvil, a Rivetter's Hearth,



a Brazier's Hearth, a Mine Ventilating Apparatus, a Tool Grinder (Emery), a Cutter, a Circular Saw and Bench, a Polishing Wheel, a Chuck, Two Drills, a Drill Rest, and a Tool Box.



PATENTED IN EUROPE AND AMERICA.

The "HURRICANE" Patent Portable Forges possess advantages unobtainable with Forges of any other description. They commend themselves to the world, not only as being complete and portable Smithies and mine and ship ventilators of the highest practical value, but also for the extreme ease with which they are worked, the simplicity and compactness of their construction, and the steady continuous blast, which speedily creates an unusually high degree of heat. The "Hurricane" Portable Forges are made in nine distinct sizes, embrace attachments which form a complete smithy, and are suitable for all purposes in all climates.

The Rivetter's Hearth is readily connected to the nozzle of the forge by means of a flexible tube, and can be used in any awkward position for keeping rivets hot and close to the work. The Brazier's Hearth is similarly worked, but is constructed with a nozzle on opposite sides for producing heat equally on both sides of the work, and is particularly adapted for brazing band saws, &c. Hand Blowers for all ventilating purposes, and for fixed blacksmiths' hearths, are made on a new principle.

The Lever Handle can be used at any angle, or taken off altogether, and the Treadle used instead. There is a Recovering Spring to raise the Handle or Treadle. This arrangement secures all the easy motion of the old-fashioned bellows, is worked with much less effort than the Rotary Hand Wheel, and there are no Leather Bands to be burnt, no Cranks, and consequently no "Dead Centres." Three larger sizes than those given below are kept in stock.

A 1-INCH BAR OF IRON CAN BE RAISED TO A WELDING HEAT IN TWO-AND-A-HALF MINUTES.

PRICES.	
No. 0.—THE AMATEURS', JEWELLERS', OR DENTISTS' FORGE AND WORKSHOP, 3 ft. by 1 ft. 6 in., and 2 ft. 8 in. high, fitted as a complete Smithy, including Forge, 6-in. patent Fan Blast, Hearth, Parallel, Vice with Anvil, Emery Wheel, Chuck, 2 Drills, a Cutter, Polishing Wheel, Crucible and Tongs, Ladle, Spanners, Drawers, Treadle and Flexible Band, Automatic Clutch, &c. Weight, 84 lbs. Muffler, for conveying the smoke to chimney, 15s. extra.	£8 8s. 0d.
No. 1.—FORGE, HEARTH (lined with fire-brick), and PAN 18 in. square, 2 ft. 7 in. high. Weight 132 lbs., with 8-in. patent Fan Blast, Spanners, and Emery Tool Grinder, complete, on standard	£5 15s. 0d.
No. 2.—DITTO DITTO. Weight, 156 lbs. Fitted with 2½-in. Vice with Anvil, 4-in. Emery Wheel or Grindstone, Chuck, Cutter, and two Drills, a Buffing Wheel or Polisher, Spanner, Tool Chest, Lock and Key, &c. Lever and Treadle. Muffler, 15s. extra.	£7 7s. 0d.
No. 3.—FORGE AND HEARTH, 26 in. by 34 in. Weight, 160 lbs.: 10-in. patent Fan Blast, Spanners, and 5-in. Emery Wheel, complete on frame with four legs and two travelling wheels. Lever and Treadle	£8 8s. 0d.
No. 4.—DITTO DITTO. Weight, 184 lbs. Fitted with Two Travelling Wheels, 5-in. Circular Saw and Bench, and all the attachments of No. 2 Forge, but increased in suitable proportions. Hood, 21s. extra. Muffler, 35s. extra.	£10 10s. 0d.
No. 5.—FORGE AND HEARTH, 30 in. by 42 in. Weight, 250 lbs. With 12-in. patent Fan Blast, Spanners, and 6-in. Emery Wheel, complete on frame with four legs. Fitted with Lever Treadle, Two Travelling Wheels, and Fast and Loose Pulleys for power	£12 12s. 0d.
No. 6.—DITTO DITTO. Weight, 280 lbs. Fitted with all the attachments of Nos. 2 and 4 Forges, but proportionately increased in size. Hood, 30s. extra. Muffler, 42s. extra	£15 15s. 0d.

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IRONWORKS AND MINES IN YORKSHIRE.

THE KIRKSTALL FORGE, NEAR LEEDS.

One of the oldest, largest, and best known iron and steel establishments in the North of England is the Kirkstall Forge, situate about three miles from Leeds, and not far from the picturesque and historical ruins of the Cistercian Monastery, Kirkstall Abbey, and to which we paid a visit a few days since in company with an esteemed and genial cicerone. The works are pleasantly situated, being embedded in the midst of delightful scenery, whilst the River Aire meanders gently along by the side of the works. There is every evidence that hundreds of years ago the inmates of the Abbey were well acquainted with the manufacture of iron, and in one of the windows there is a cast-iron mullion that must have been made centuries ago. The existing works, however, were established by the family of the present owner (Mr. BUTLER) in 1779, and when in full operation find employment for about 1000 hands. The estate consist of about 100 acres, whilst the works cover an area of about 14 acres, and are connected by a siding with the Leeds and Bradford Railway. The works are noted for all descriptions of railway tyres and axles, crank axles, forgings, and bar-iron, as well as for patent rolled shafting, made from the well-known iron, marked "K.M., Kirkstall," or in Bessemer steel. There are large shops for making wheels and axles capable of producing at least 150 sets a week, and steam-hammers up to 50 tons as well as turntables are also turned out. There are three rolling-mills and a number of puddling furnaces, principally double, worked by what is known as the JOE PICKLES mechanical rabble, the invention of a foreman formerly employed at the works, and which is considered as a satisfactory compromise between the ordinary furnace and the rotary furnace of DANKS or CROMPTON. There is a tank engine carrying a swing crane worked by steam, capable of lifting 3 tons, so that the load can be taken to any part of the works. Two water-wheels are still on the ground that worked the helves more than 200 years ago. There are several powerful steam-hammers, and a most valuable machine for straightening and planishing round bars for shafting, the importance of which cannot be over-estimated. The bars are passed whilst still hot from the rolls between two revolving discs having bevelled faces, which when brought together so as to compress the bars between them with the amount of force considered necessary rotate them, and at the same time traverse them forwards, also by a mechanical arrangement backwards, so that the whole length of the bar is acted upon by one continuous movement, and the bar comes out straightened and planished.

In carrying out this system two other important results are obtained, one of them being that the scale, instead of being rolled in, as might be supposed, is entirely removed, and the surface made quite smooth. The skin is brought to such a high degree of cleanliness and smoothness that a mere rubbing with emery cloth, or if the bar be put into the lathe with emery stick, polishes it as if it had been turned and polished in the ordinary manner. If the bars, after being allowed to go cold, are passed through the machine several times the blue skin disappears, and the bars come out actually bright. The machine consists of a pair of vertical discs, which rapidly revolve on horizontal shafts; the former, being nearly equal in diameter, are placed face to face, but not with their centres opposite, there being a horizontal distance of about 9 in. between the centre lines of them. When at the right temperature the bar is placed on the table of the machine, which is on a level with the floor, and one end is inserted between the discs, when it immediately begins to revolve and travel longitudinally, and very quickly the whole length of the bar has been operated upon, and entirely and completely planished. The surfaces of the discs which perform the operation are quite smooth, and during the process a plentiful discharge of water descends upon them, and the bar leaves the machine with a smooth skin, perfectly free from scale, with a dark blue polish. Mr. D. KERKALDY made several experiments to test the torsional strength of the bars so acted upon. In order to make proper comparisons, bars, after being rolled in the ordinary way, were cut in halves, one portion being left with the ordinary finish and the other being put through the machine, and it was found that up to the point of elastic stress the machined bars had gained 20 per cent. in torsional strength. As the bars straightened and planished by the machine are 20 per cent. stronger than those left with ordinary finish, it follows that if the comparison be made with turned bars it will be still more favourable to the machined bar; and it is, therefore, important to use them wherever possible without turning, the polishing with emery removing so little of the skin as not appreciably to interfere with the strength. There is also another important point gained by the machine. If there is any unsoundness in a bar which in the usual way could not be discovered the machine is so searching that the bar could not pass through without the defect being detected.

Another of the specialities at Kirkstall in connection with the process described is the making of patent rolled shafting either in iron or steel. The shafting is produced so smooth, round, and true that for all ordinary speeds it can be run safely and satisfactorily without having to go to the trouble and expense of turning any necks, which by removing the skin deprives a shaft of a wearing power at least double that of turned iron, and also weakens it, destroying, especially in the case of necks, in the middle of a shaft its extra torsional strength. It appears, with respect to turned shafting, that in spite of employing the very best mechanics, and the most improved and perfect slide lathes, it is an impossibility to turn two shafts to be exactly and absolutely the same in diameter, and where such has actually been achieved it has been by chance, it being impracticable to turn a shaft 20 ft. long from end to end, theoretically or perfectly round and true. It is, therefore, claimed for the rolled patent shafting that it is sufficiently uniform in size, mechanically round, perfectly straight and true, no turning being required, whilst then 20 per cent. extra torsional strength over ordinary rolled iron in the rough. The shafting is, therefore, well adapted for use in all kinds of agricultural implements, printing machines, power looms, washing-machines, also corve axles, press columns, tie rods, and in all cases where brightness can be dispensed with. The shafting when cold is cut to the required length, the ends being faced and finished at the same time. All sizes are rolled, from $\frac{1}{2}$ in. in diameter increasing by 1-16th up to 2 in., increasing by $\frac{1}{4}$ up to $\frac{5}{8}$ in., and then by $\frac{1}{4}$ in. up to 7 in. diameter. Another speciality produced at Kirkstall is BUTLER'S patent frictional coupling, a most important invention, which requires neither keys, key-beds, or swells upon the end of shafts, whilst bolts, which are always fruitful sources of danger, are dispensed with, whether the shaft be too large or too small the coupling is still effective and truly concentric, self-containing, compact, and neat, and can be used as a pulley. One novelty in connection must not be overlooked. It can be put up and taken down in ten minutes by a man of intelligence, as full instructions are stamped upon each piece. We were also shown a hydraulic pressing for forg-

ing and stamping malleable iron in the system. HASWELL, of Vienna, two of which we believe are all their own in this country, the second one being at the Cyclops Works, Sheffield, and has been used for bending heavy armour-plates. There are separate workshops where the axles are made, there being the best appliances for economising manual labour. The tyre-mill is by TANNETT and WALKER, the finishing rolls being immediately above the roughing. In another part of the works there are anvil-forging shops and furnaces for case-hardening the axles, with a small iron foundry, where the boshes for axles are made, with a brass foundry for the casting of the caps.

The engines and machinery are in every way excellent, there having evidently been no cost spared in making the Kirkstall Works about the most complete in the kingdom. The offices are of comparatively recent construction, are on a large scale, with every desirable facility for carrying on the necessary works, and for communicating with other parts of the works. As to the products of the works it is not necessary to speak further, for they have the highest reputation in all the markets of the world, and have obtained at most Exhibitions, including London in 1851 and 1862; Moscow, 1872; Victoria, 1873; Leeds, 1880 and 1875; as well as at the meeting of the Royal Agricultural Society of England, and at several others. It may also be said that Kirkstall has been a nursery ground for other districts, for the Staffordshire iron trade in some measure sprang from it, for two lads, twins, went from the forges into Staffordshire, and set up a small establishment, at which they made what was called bullet iron, and this they were successful in introducing into the market for fluted rollers. These lads were the Messrs. THORNEYCROFT, a family now well known in connection with the iron trade of Staffordshire. Then as to BOLCKOW, VAUGHAN, and Co., we are told by Mr. BUTLER, the proprietor, that Mr. VAUGHAN's father turned rolls at Kirkstall Forge, and Mr. VAUGHAN had taught him more of the trade than anyone else. In concluding our notice of a visit to the works at Kirkstall, in which there was so much to interest, we cannot but express our thanks to Mr. BUTLER, jun., who took great pains in showing and explaining to us all that was so well worth seeing.

GOVERNMENT INSPECTION OF MINES.

THE INSPECTORS' REPORTS.

The reports of the Government Inspectors of Mines for 1879, which have just been issued, are the most favourable which have appeared for several years past, there having been $\frac{3}{4}$ per cent. fewer separate accidents—782, against 811; whilst the number of deaths resulting shows a decrease of over 31 per cent.—973, against 1413. The 35 separate explosions caused 184 deaths, or rather more than five deaths on the average to each explosion, which is a far more satisfactory percentage than usual, and the remaining 747 separate accidents caused but 789 deaths, which is highly gratifying, since it shows that only one accident in 20 was fatal to more than one person. When it is considered that no less than 476,810 persons were employed, with a loss of but 973 lives, or one life for every 490 men employed, colliers may be congratulated upon the fact that, owing to the excellent management and extraordinary precautions adopted, they are freer from danger whilst at work than nine-tenths of the artisans employed above ground, and that considering the number of lives risked the collieries of Great Britain are absolutely safer than the streets of London. During 1878 there were 475,329 persons employed, and they raised 132,612,063 tons of coal, 1,625,586 tons of fire-clay, 10,747,227 tons of ironstone, and 813,262 tons of shale—together 145,798,138, so that one life was lost for each 103,183 tons of mineral raised, and there was 1 death for every 336 persons employed. During 1879 the 476,810 persons employed raised 133,720,393 tons of coal, 1,455,003 tons of fire-clay, 9,387,766 tons of ironstone, and 803,207 tons of oil-shale, &c.—together 145,366,369 tons, showing 1 life lost for each 149,400 tons of mineral raised, and 1 death for each 490 men employed, as already stated. We subjoin our usual tabulated summary, which will permit of the several classes of accidents being compared—

COAL MINES—1878.

Names of districts.	Separate accidents.					Deaths resulting.				
	Explosions of fire-damp.	Falls of coal, sides, and roof.	In shafts.	Miscd., in mine and at surface.	Total.	Explosions of fire-damp.	Falls of coal, sides, and roof.	In shafts.	Miscd., in mine and at surface.	Total.
Northumberland, Cumberland, & North Durham	1	31	3	14	49	1	32	4	14	51
South Durham & Westmoreland	3	36	7	32	78	4	37	7	35	83
Cleveland, ironstone	—	7	—	10	17	—	7	—	10	17
North and East Lancashire	3	32	4	15	54	45	33	4	17	99
Ireland	—	2	—	—	2	—	—	—	—	—
West Lancashire and N. Wales	5	52	8	37	102	204	54	9	37	304
Yorkshire	4	38	4	30	76	4	39	5	32	80
coal field ironstone	—	1	—	—	1	—	1	—	—	—
Lincolnshire ironstone	—	—	—	—	—	—	—	—	—	—
Derby, Notts, Leicester, Warwick	—	29	7	18	49	—	31	11	13	55
ironstone and fire-clay	—	—	—	—	—	—	—	—	—	—
North Staff., Cheshire, Salop	3	21	9	3	36	28	21	10	3	62
ironstone	—	10	2	—	12	—	10	3	—	13
South Staff. and Worcestershire	1	30	7	6	44	1	31	7	8	47
ironstone and fire-clay	—	1	2	—	3	—	1	2	—	3
Monmouth, Gloucester, Somerset & Devon	1	44	4	16	65	268	45	4	16	303
ironstone	—	—	—	—	—	—	—	—	—	—
South Wales	5	60	18	28	111	7	62	21	33	123
ironstone	—	—	—	—	—	—	—	—	—	—
East Scotland	1	32	12	13	58	2	33	17	13	65
ironstone and shale	—	3	1	1	5	—	3	1	2	6
West Scotland	4	25	5	10	44	22	25	5	12	64
ironstone and shale	—	2	1	2	5	—	2	1	2	5
Total coal mines	31	439	88	217	775	586	452	104	233	1375
Total iron, fire-clay, and shale	—	17	6	13	36	—	17	7	14	38
Gross total	31	456	94	230	811	586	469	111	247	1413

COAL MINES—1879.

Northumberland, Cumberland, & North Durham	1	23	6	33	63	1	23	6	34	64
South Durham & Westmoreland	—	28	5	21	54	—	29	6	21	56
Cleveland, ironstone	—	9	1	5	15	—	9	1	5	15
North and East Lancashire	3	29	9	15	56	10	31	10	16	67
Ireland	—	—	—	—	—	—	—	—	—	—
West Lancashire and N. Wales	2	46	9	30	87	5	47	15	30	97
Yorkshire	3	38	7	28	78	31	40	14	28	113
“ coal field ironstone	—	1	—	—	1	—	1	—	—	1
“ Lincolnshire ironstone	—	—	—	—	—	—	—	—	—	—
Derby, Notts, Leicester, Warwick	1	26	5	14	46	1	26	6	14	47
“ ironstone and fire-clay	—	—	—	—	—	—	—	—	—	—
North Staff., Cheshire, Salop	3	18	5	12	38	10	18	5	12	45
“ ironstone	—	2	1	—	3	—	2	1	—	3
South Staff. and Worcestershire	5	28	10	12	55	10	28	10	12	60
“ ironstone and fire-clay	—	3	—	—	3	—	3	—	—	3
Monmouth, Gloucester, Somerset & Devon	2	46	5	13	66	9	48	5	13	75
“ ironstone	—	—	—	—	—	—	—	—	—	—
South Wales	7	67	18	30	122	70	68	25	32	195
“ ironstone	—	—	—	—	—	—	—	—	—	—
East Scotland	4	26	7	12	49	32	25	8	14	80
“ ironstone and shale	—	2	3	1	6	—	2	3	1	6
West Scotland	4	15	4	5	28	5	18	5	6	32
“ ironstone and shale	—	9	—	5	14	—	9	—	5	14
Total coal mines	35	390	90	225	740	184	400	115	232	931
Total iron, fire-clay, and shale	—	26	5	11	42	—	26	5	11	42
Gross total	35	416	95	236	782	184	426	120	243	973

The number of persons employed during 1879 in and about the mines classed as metalliferous was 47,060, against 51,458 in the preceding year. Of the total number employed in Great Britain 27,374 were underground, and 18,266 above ground. And in Ireland 891 underground, and 529 above ground. There are 52 females under 13 employed in Cornwall and Devon, 2 in Sussex, and 2 in Ireland, all at surface. There were 792 (645 in Cornwall and Devon) females

between 13 and 18, and 1365 (1111 in Cornwall and Devon) of the age of 18 employed at surface. No females were employed underground. From the subjoined summary it will be seen that the aggregate the following quantities of mineral were produced during the two years reported upon:—

MINING PRODUCE.	1878—tons cwt.		1879—tons cwt.	
	1878—tons cwt.	1879—tons cwt.	1878—tons cwt.	1879—tons cwt.
Arsenic (obtained at the mines)	4,464	14	—	—
Arsenical pyrites	3,639	2	—	—
Barytes	21,715	12	—	—
Bauxite	5,426	0	—	—
Bismuth ore	538	0	—	—
Bluestone	264,662	10	—	—
Calc spar	3,181	14	—	—
Cement stone	2,720	10	—	—
Chert	3,997	0	—	—
Coal ore	93	18	—	—
Copper ore	54,568	12	—	—
Copper precipitate	532	3	—	—
Dross spar	327	16	—	—
Fluor spar	10,485	0	—	—
Gannister	251	19	—	—
Gold	702oz. 16d. 8gr.	—	—	—
Gold ore	29,265	lb.	—	—
Gypsum	74,908	0	—	—
Iron ore	2,559,333	19	—	—
Iron pyrites	14,759	18	—	—
Jet	Unknown	—	—	—
Lead ore (dressed)	74,771	2	—	—
Lead ore (undressed)	1,610	0	—	—
Limestone	478,773	0	—	—
Litharge	—	—	—	—
Manganese ore	1,734	4	—	—
Ochre	2,903	5	—	—
Phosphate of lime	16	0	—	—
Potter's clay and other clays	60,261	0	—	—
Rock salt (exclusive of the white salt made from brine)	182,930	0	—	—
Sand	153	ozs.	—	—
Silver ore	85	5	—	—
Silver precipitate	8 cwt. 2 qrs. 17lb.	—	—	—
Slate and slabs (dressed)	169,041	1	—	—
Slate (undressed)	—	—	—	—
Steatite	57	0	—	—
Stone (building stone, flags, kerbs, &c.)	14,411	10	—	—
Tamping stone	60	0	—	—
Tin ore (dressed (black tin))	13,632	10	—	—
Tin ore, partially dressed, estimated to contain 8 tons 5 cwt. black tin	950	9	—	—
Tin ore, undressed (tin stuff), estimated to contain 434 tons 9 cwt. black tin	9,847	17	—	—
Umbro	—	—	—	—
Uranium ore	—	—	—	—
Whinstone	17,871	0	—	—
Wolfram	10	0	—	—
Zinc ore	24,682	12	—	—

The fatal accidents at the mines classed under the Metalliferous Mines Regulation Act in Great Britain and Ireland amounted to 74 in the preceding year, the casualties thus being less numerous than last year. From these accidents a number of deaths resulting was 64, being 13 less than in the preceding year. It appears that in 1879, in the mines classed under the Metalliferous Mines Regulation Act, there was one fatal accident amongst every 771 persons employed in and about the mines, one death by accident amongst every 735 persons employed; in 1878 one fatal accident amongst every 811 persons, and one death by accident amongst every 1413 persons employed in and about the mines. The subjoined summary will facilitate the comparison

METALLIFEROUS MINES—1878.

Names of districts.	Separate accidents.					Deaths resulting.				
	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Total.	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	
Northumberland, Cumberland, &c.	7	10	4	1	22	7	10	4	1	
Durham, Westm., and N. Yorks.	—	—	—	—	—	—	—	—	—	
East and West Yorkshire	—	—	1	—	2	1	1	—	—	
Cheshire, Sussex, &c.	—	—	—	—	—	—	—	—	—	
Lancashire West	1	—	—	1	1	1	—	—	—	
North Wales, Isle of Man, &c.	1	1	6	2	12	1	1	1	1	
South Staff. and Worcestershire.	—	—	—	—	—	—	—	—	—	
Gloucester, Monm., Somerset, &c.	1	1	1	—	3	1	2	1	—	
Glamorgan, Pembroke, &c.	—	—	—	—	—	—	—	—	—	
Cornwall, Devon, &c.	7	4	5	5	21	3	4	6	1	
East Scotland	2	1	—	—	3	2	1	—	—	
Ireland	2	—	—	—	2	2	—	—	—	
Total	27	18	21	8	74	27	19	23	1	

METALLIFEROUS MINES—1879.

Names of districts.	Separate accidents.				Deaths resulting.			
	Falls of ground.	In shafts.	Miscellaneous underground.	At surface.	Falls of ground.	In shafts.	Miscellaneous underground.	

coveries at Leadville have revealed the most extensive and easily accessible mass of silver ores ever opened on the Continent, the peculiarity being that the vein is found at the point of contact where an extensive sheet of superficial limestone has been overflowed by a lava deposit. There are many other places where the same geological conditions exist, and it is believed that similar contact veins will be found in each instance. The smallness of the deposit of soil throughout the region (enabling the character of the rocks to be easily seen), and the situation of the lodes, are alike very favourable to a rapid extension of mining. The countervailing evils are the scarcity of timber for props and fuel for smelting, coal having to be brought from Pennsylvania for the latter purpose; the unfitness of the region for agriculture is another disadvantage. Hay is now worth more than flour in the Rocky Mountain camps, and last winter it was sold at about 30¢ per ton in Leadville. The extension of railways will lessen these drawbacks. There are, however, thousands of lodes which would otherwise be exceedingly productive, which will not yield a profit because of the cost of food and fuel. Mr. Shaler appears to think that the important source of gold supply in America in the future will be the deposits in the river gravels and sands. Every region in which gold lodes have been found yields a large quantity of this surface gold, probably carried down from small lodes which individually would not pay for working. South of the Potomac the regions which promise a large yield of gold by washing are very extensive. Such deposits are reported to be very plentiful also along the banks of the rivers within the Cordilleran chain. The yield is slow, sure, and definitely measurable, and it is apparently neglected because it does not offer the speculative chances which prove the charm of vein deposits. In conclusion, Mr. Shaler remarks that the production of silver is destined to increase very rapidly for a score or so of years; but after a brief term it will diminish, especially if here should be any considerable decline in the price. As an observer, he considers that the production of gold is likely to be extended to many new fields, and to be in the future more steady than that of its white rival.

THE LOVELL TIN MINING COMPANY.

the works at surface kept on regularly, and the machinery is in good working order. We estimate the raisings for July at 175 tons.

BUEYAS, VAGUAY.—July 7: In the 40, driving west of Cox's engine-shaft, the men are driving a good lode, and the surface is in good order, and on the course. The 40, driving east of Cox's engine-shaft, is still idle, and the men put to assist the timberman. Cox's engine-shaft, sinking below the 40, is completed to the 50. The men are put to strip down a piece of the north side of the shaft for barrow-road, which will occupy about a week before we commence driving levels east and west on the course of the lode. The cutting down of Taylor's engine-shaft sinking below the surface was suspended in January, owing to an increase of water. We have erected a good horse-whim, and resumed working; and the men are put to work to raise the bottom of the shaft, when the sinking will be commenced. The surface work is going on with its usual regularity. The engineer has commenced to erect Taylor's shaft on the Emma step. The tributaries are returning fair quantities of ore, especially on the Atlantida lode.

FORTUNA.—July 6: Canada Inco's: The 120, driving west of O'Shea's engine-shaft, is producing $\frac{1}{2}$ ton of lead ore per fathom, and passing through a harbor of ground. The lode in the 50, driving west of Abercrombie's shaft, contains spots of lead, but not enough to value. In the 60, driving in the same direction, the lode is improving within the last few days, and is worth $\frac{1}{2}$ ton per fathom. The 70, driving east of Abercrombie's shaft, contains a good lode, valued at $\frac{3}{4}$ ton per fathom. The lode in the 80, driving west of San Pedro's shaft, has decreased in size and value. In the 80, driving east of Sah Pedro's shaft, the lode consists of quartz, lime, and lead ore, and worth $\frac{1}{2}$ ton per fm. The lode in the 70, driving east of San Pedro's shaft, is small at present. In the 120, driving east of O'Shea's engine-shaft, the lode has split into numerous branches which are of no value. The lode in the 100, driving east of Lowndes' engine-shaft, is improving in appearance and opening out good tribute ground; and the 110, driving east of Lowndes' shaft, contains a good lode, and is worth $\frac{1}{2}$ ton per fathom. The 120, driving east of Lowndes' shaft, there is a large and well-defined lode, producing 1 ton of ore per fathom. San Pedro's engine-shaft, sinking below the 80, is down the required depth for a 90 fm. level. The lode in Cristo's winze, sinking below the 30, and valued at $\frac{1}{2}$ ton per fathom, has fallen off in value of late. Rosa's winze, sinking below the 70, consists of a strong fine-looking lode, worth 1 ton of lead ore per fathom.

Los Salidos. In the 175, driving west of Taylor's engine-shaft, the lode at present is small and poor. The lode in the 160, driving in the same direction, and producing $\frac{1}{2}$ ton per fathom, is strong, yielding a good quantity of lead. The 175, driving east of Taylor's engine-shaft, has a compact lode, producing good stones of ore, worth $\frac{1}{2}$ ton per fathom. The lode in the 160, driving east of Taylor's engine-shaft, is large, consisting of quartz and spots of lead ore. In the 145, driving east of Taylor's engine-shaft, the lode maintains its size, but has fallen off in value, being now worth $\frac{1}{2}$ ton per fathom. The lode in the 130, driving east of Taylor's engine-shaft, is congenial and improving, and worth 1 ton per fathom. The 120, driving east of San Pablo's shaft, is opening out splendid ore ground, and 3 tons per fathom. In the 80, driving east of Taylor's engine-shaft, the lode is a medium-sized lode, worth $\frac{1}{2}$ ton per fathom. No improvement has yet resulted in the 80, driving west of Palgrave's engine-shaft. Maurice's winze, sinking below the 160, and valued at $\frac{1}{2}$ ton per fathom, maintains its size and value.—San Anton. The lode in the 45, driving east of Henty's engine-shaft, and worth $\frac{1}{2}$ ton per fathom, is regular, but fallen off in value during the past few days. The 30, driving east of Henty's engine-shaft, consists of a large lode, producing 1 ton per fathom; ground easy for driving through. The lode in the 45, driving west of Henty's engine-shaft, is 3 ft. wide and produces a good lode, worth 1 ton of ore per fathom. The 40, driving west of Henty's engine-shaft, there is a strong lode, yielding good lumps of ore, valued at $\frac{1}{2}$ ton per fathom.

LINARES.—July 7: The lode in the 115, driving east of Warner's engine-shaft, is improving, and is producing ton of lead ore per fathom. In the 135, driving west of Peill's engine-shaft, there is a large open lode, yielding good stones of ore; worth $\frac{1}{2}$ ton per fathom. The lode in the 120, driving in the same direction, and valued at 2 tons per fathom, is a little smaller than it was a few days ago, but is still yielding a good lode, worth 1 ton of ore per fathom. The 90, during the past fortnight, and is worth $1\frac{1}{2}$ ton per fathom. The lode in the 135, driving east of Peill's engine-shaft, and producing $\frac{1}{2}$ ton per fathom, is small, and the ground very hard for driving. In the 120, driving east of Peill's engine-shaft, the lode is of a promising appearance, consisting of carbonate of lime and lead ore; worth 1 ton per fathom. Good progress is being made in Warner's engine-shaft, sinking below the 115. In No. 234 winze, sinking below the 120, the lode producing 2 tons per fathom has fallen off a little in value during the past fortnight, and is now yielding a good lode, worth 1 ton of ore per fathom. The lode in No. 236 winze, sinking below the 90, is compact and regular, consisting of carbonate of lime and lead ore, valued at $\frac{1}{2}$ ton per fathom. The weekly returns of ore were kept up very steadily throughout the past month, and the stopes are yielding well at present. The ordinary surface works are going on regularly, and the machinery is in good working order. We estimate the raisings for July (five weeks) at 300 tons.—Quinientos Mine: In the 100, driving east of Taylor's engine-shaft, the lode continues unproductive. The lode in the 90, driving east of Taylor's engine-shaft, is a good lode, and is worth $\frac{1}{2}$ ton per fathom. The 80, driving east of Taylor's engine-shaft, is a good lode, and is worth $\frac{1}{2}$ ton per fathom. In the 80, driving east of western boundary, the lode contains a little ore, but not sufficient to value. The lode in the 65, driving east of western boundary, is small, consisting chiefly of quartz, and with a few spots of ore. Judd's shaft, sinking below the 65, is off the lode, and the granite hard for sinking. We estimate the raisings for July at 75 tons.

NEW GAS FOR GAS MOTORS.

Heretofore all systems employed for the production of carburetted vapour (hydro-oxide of carbone) by the decomposition of steam have required several apparatus distinct from each other—a steam generator and a gas generator, connected with each other by pipes, and a delicate and expensive distributor—so that there have been the objections of heavy first cost, great bulkiness, and much manual labour to work them. The arrangement invented by Mr. Delhaynin, of Paris (and patented through Mr. De Pass, of Fleet Chambers), is characterised by the simultaneous and automatic production of steam and its decomposition to form carbonic oxide in one and the same apparatus; the employment of a syphon for the double purpose of introducing the water to be vaporised and equalising the gas pressure, the simultaneous and automatic production of steam and hydro-carbonic oxide with the same apparatus and a single furnace; the utilisation of the heat of the produced gas to heat the feed-water, the condenser also cooling the gas, which is essential; the rapid vaporisation of the heated feed-water in an interior cylindrical coil around the retort, regulating the production of steam and of gas by cocks or valves regulating the admission of water, and employing, if necessary, the produced gas to promote combustion of the coal or coke by introducing it into the furnace by means of a branch pipe fitted to the gasholder or to the exit pipe of the hydraulic condenser.

The working of the new apparatus and its advantages will be readily understood. The generator consists of a cast-iron retort, serving as a furnace for the apparatus; it is provided at its lower part with a grating, and closed by fixed or moveable fire-bars. This grating is articulated, to allow of drawing and cleaning the fire-box. A cast-iron air-tight chamber surrounding the retort serves as an ash-pit, and as an air-tight door, to permit of cleaning. A spiral gutter is cast on the outer circumference of the retort. This retort, highly heated by the furnace, vaporises the liquid flowing down the gutter, which by means of an inverted syphon is connected with a funnel. A sheet-iron cylindrical air-jacket prevents the apparatus from cooling. The brickwork "laboratory," enclosed in a casing of strengthened sheet-iron, rests on the flange of the retort, at the top of which is a charging hopper, closed at top by a hinged hopper and at bottom by a cone. When the apparatus is in operation the water flows along the spiral gutter, is vaporised, and, having no other outlet than the grate of the furnace, ascends through the coke, and is decomposed. The free hydrogen, the carbonic oxide, and a small proportion of other gases are collected in the hydraulic condenser, and afterwards washed. The arrangement, of course, admits of various modifications, according to the character of fuel, hydro-carbons, &c., that may be available; but the great recommendation of the invention appears to be that it will admit of the use of gas motors where, from the absence of a gas supply, they are at present excluded.

AMALGAMATING ORES.

The nature of the invention of Mr. C. E. BALL, of Philadelphia, consists in producing an amalgam by causing the ore in a properly comminuted condition to pass through a body of mercury by entering the same from below and emerging therefrom above, the process being attained by exhausting the air from the upper surface of a column of mercury so that it shall become suspended and supported by the atmospheric pressure at its base, and then admitting the ore beneath said suspended column. The invention consists still further in the combination, construction, and arrangement of parts for carrying the process into effect. The apparatus for carrying the invention into practice may consist merely of a bent U-shaped pipe placed with its curve downwards, and whose first arm is provided with a hopper to facilitate the delivery therein of the ore to be amalgamated, and whose second arm is made to project upwards at least 77 centimetres above the bend, and is fitted at its upper end with a steam jet or other equivalent device for exhausting the air and discharging the residuum of ore from the amalgam.

GOLD AND SILVER MINING IN AMERICA.

The future of gold and silver mining in the United States is the subject of an interesting article by Mr. N. S. Shaler in the current number of the Atlantic Monthly. The fields of the precious metals in the United States may be generally divided into two principal areas, that of the Appalachian and that of the Cordilleran range. Besides these there is the region about Lake Superior and the Osage region in Arkansas and Missouri. It is certain that the whole of this rich agricultural region of the Mississippi, the whole of the Western plains, and the whole of the low-lying plains of the Southern States (in all a little over one-half the total area of the States, and including nine-tenths of its arable land), must be excluded from the districts where the precious metals are likely to be produced in paying quantities. Mr. Shaler points out that the difference in the conditions (probably thermal) governing the concentration of the precious metals has had the effect of causing the richest gold ore to be found where the proportion of silver is relatively thin, and *vice versa*. Gold is found chiefly in the older slates, schists, and granite rocks; while silver is found chiefly in close relation to limestones where these have been brought into contact with lava. On the eastern side of the Continent, in the Appalachian mountain system, there is an almost uninterrupted gold field from Nova Scotia to Alabama; on the western face, bordering on the sea, but separated therefrom occasionally by a range of mountains, there is a similar but much richer gold field. In the middle part of the Cordilleran system, from the Sierra Nevada eastward to the plains, lies the great silver belt. In the eastern gold field very little silver has been found, except in a small region in New England near Boston, and there is no likelihood that any considerable deposits will be found there; the gold deposits have, however, yielded largely at half a dozen places in the district in spite of very imperfect methods of working. In the California coast region silver is found mixed more plentifully with gold than on the Atlantic coast, but there have never been any profitable silver mines west of the Sierra Nevada. Coming eastward from this point the gold thins out (though it persists), and the proportion of silver becomes stronger. The famous Comstock lode shares equally in the two metals. The dis-

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro
12: Produce for the month of June, 28,000 tons.—19,850 $\frac{1}{2}$, yield, 6 $\frac{1}{4}$ cts. per ton.
Peru—Cubata: 150 tons stamped in fifteen days; yield, 2·7 cts. per ton. All
going on well.

ALMADA AND TIRITO CONSOLIDATED.—Telegram from Mr. Clemes, dated
June 25: In the submitted you bullion, \$2400.

BLUE TEST.—June 25 Telegram from the manager: Partial clean up, \$19,600.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada,
June 25: The output for the month of June was 100 tons of ore. At the
week's run, \$63,000, from 990 tons of ore. Refinery, \$50,000. Short blast all the
week. Accident to blower; now under repair.

E. Rickard, June 23: During the past week operations have been carried on
with regularity. The 200 north-west drift has been extended 13 ft.; ground
somewhat more favourable for drifting. The 200 west drift has been extended
10 ft.; the ground in this drift is much more favourable for drifting than it has
been for some time. The 600 east cross-cut No. 1 chamber has been extended
to hard limestone. The 600 west has been extended 10 ft. without any change
of mention. The 600 No. 1 cross-cut, west from south fissure drift, has been ex-
tended 10 ft.; ground favourable for progress. The 700 drift from winze has
been advanced 13 ft. in favourable ground for ore. The 800 west has been ex-
tended 1 ft. in hard limestone without any change to mention. The 900 west
has been extended 9 ft. in the same character of ground. Lizeta tunnel cross-cut has
been extended 7 ft. without any change of mention. The chambers are all look-
ing well, and turning out the usual quantity of good ore.

CAPE COPPER.—OOKIEP: Captains Heitwood and Lanksbury, May 31: Al-
though preparatory work having been completed at the new shaft, the sinking will
not start forthwith to the 105. The 92 fm. level, south-east of new shaft,
shows a slight improvement; the present end produces 6 tons of copper ore per
fm. At the mouth of this level the side is being cut out in order to sink a winze
to the 80 fm. level, has now reached the 105 fm. level, although good stoping
ground, worth on the average 6 tons of copper ore per fm. The present bottom is
productive. The men in the 80 fm. level, east of the new shaft, are still em-
ployed in cutting outside of level to prove the run of the productive ground.
The shaft, the dipping of stopping the side of the 80 fm. level east, towards the new
winze again resumed. The end at present yields 3 tons of copper ore per fm. The
80 fm. level, east of New Winze, produces 3 tons of copper ore per fm. There
is no change to notice in the 92 fm. level, south-east, 31 wins and north
wards the same; we hope to effect communication in these levels during the
coming month, which will cause good ventilation in this part of the mine. The

TREVINCE CONSOLS.—We understand the lode in the shaft referred to in last week's report is increasing in size, now over 8 feet wide, full of gossan, prion, intermixed with black and grey copper ore. Such a lode as this was never known to fail to make masses of copper ore in a little depth. The more the operations are extended the more conclusive it seems that this will prove a most valuable mine.

HOLLOWAY'S ILLS AND OINTMENT.—Throughout the summer these remedies are always most applicable for the complaints which then prevail, and they will be found most serviceable and invaluable for the relief of diarrhoea, cramps, and English cholera. These remedies can always be used with perfect safety by persons of every age, and in every season, and in every climate. The vegetable and mineral drugs which are contained in these remedies are of the most delicate and the most valuable kind, and they are unattended with any of those risks which mineral drugs possess. Prof. Holloway has compiled a set of instructions for use in the various maladies to which humanity is subject, and by carefully and perseveringly attending to and following out their directions,

5% to 5%. — The Clock. — Brighton, A's, Italian mail; the buying being stimulated by the excellent character of the report issued this morning. The prices now show an improvement of $\frac{1}{2}$, being 162 $\frac{1}{2}$ to 162 $\frac{1}{2}$. Sheffield A's have been

SAURDAY, JULY.—There was a great deal of eager bidding for Sheffield, A, and the price was run up $1\frac{1}{2}$ to 62 $\frac{1}{2}$. The ordinary stock, which is entitled to all the receipts up to 6 per cent., is about to receive 2 per cent., the deferred is, therefore, of questionable value at present, and being largely "beared" the "knowing ones" have only to bid for it to get the price elevated to any extent; this is considered to be the true explanation of the extraordinary rise. There was no buying of any other railway stocks, but some considerable selling. East London fell $\frac{1}{8}$. Canadian Railway were dull. Just now the shareholders are not likely to buy any more of the stock. The trunk is selling at 100. The Second Preference dividend is secured in full, and the other attempting to show that only 1 per cent. is possible instead of 5 per cent.

MONDAY.—This was Contango day, and Sheffield A was made to appear scarce. "Bears" were unable to secure any premium for delaying delivery, and those who in despair closed their accounts by buying back had to give 64. The same manoeuvre was attempted at first in Brighton A, but as the settlement proceeding the stock was found to be far overbought. After touching 112 $\frac{1}{2}$ the price receded to 112, and the buyers of the trunk were likewise disappointed. The spirited buying of Eries and Atlantics took place, at an average rise of $\frac{3}{8}$ to 1.

TUESDAY.—Amid considerable excitement the Brighton dividend was announced as 4 $\frac{1}{2}$, being equal to the highest expectations. The A's from being 163 fell rapidly to 162, the last price being 162 $\frac{1}{2}$ to 162 $\frac{1}{2}$. The buoyancy in other railways was at once checked. Sheffield, A, from being 65 $\frac{1}{2}$ relapsed to 64 $\frac{1}{2}$. Caledonian, however, maintained a firm appearance, and from being 110 $\frac{1}{2}$ closed at 111 $\frac{1}{2}$. Erie share was sold at a discount of over 5, and the price of the trunk was again checked. The trunk failed to show any improvement. Bedford Union Mining shares were in considerable demand, and quoted $\frac{1}{2}$ to 1 $\frac{1}{2}$.

WEDNESDAY.—Business was done in Caledonians at over 112, but owing to a sharp fall in the Glasgow iron market sellers came in, and the price closed below that of yesterday. Sheffield, A, were sold at one time down to 63 $\frac{1}{2}$, but finished at 64 $\frac{1}{2}$. Very little was done in Brighton, A, and the changes were unimportant. Chatham Ordinary were largely dealt in at higher rates. Trunks were quite neglected, and closed without change. The mid-monthly settlement was finally closed at noon.

THURSDAY.—In the course of the account just finished the most marked rise in railways has been seen in Sheffield, A, which was dealt in during the previous account at 52, and carried over at 57. On Monday the carrying over price was fixed at 64. During 1879 the highest point reached was 44 $\frac{1}{2}$, and the lowest 33 $\frac{1}{2}$. There does not appear the remotest chance of a dividend, as the ordinary is entitled to 6 per cent., and is only to have 2 per cent. The holders of this stock are therefore to be disappointed. The directors of Great Laxey have declared a dividend of 8s. per share. Trunks declined on an adverse circular; this time from Glasgow.

FRIDAY (Opening).—Most American shares are higher on receipt of better prices from New York. Eries are 84 $\frac{1}{2}$; New York Central, 113 $\frac{1}{2}$; and Atlantic and Great Western First Mortgage, 68 $\frac{1}{2}$. Egyptian bonds are inclined to dullness. Unified being only 62 $\frac{1}{2}$, while Dana bonds are $\frac{1}{2}$ per cent. down. The home railways, Caledonians are steady at 111, and Brighton, A, at 112. Sheffield, A, have fallen to 64. Erie 84. The trunk is at 100. The Moyas are 4 $\frac{1}{2}$ per cent. Nouveau Monde, 3 $\frac{1}{2}$ to $\frac{1}{2}$; Panucllo, 4 $\frac{1}{2}$ to 4 $\frac{1}{2}$; Ruby, 7 $\frac{1}{2}$ to 7 $\frac{1}{2}$; Frontino, 3 $\frac{1}{2}$ to 3 $\frac{1}{2}$.—Two or Clock.—Brighton, A, remain firm, the buying being stimulated by the excellent character of the report issued this morning. The prices now show an improvement of $\frac{1}{8}$, being 162 $\frac{1}{2}$ to 162 $\frac{1}{2}$. Sheffield A's have been

Notices to Correspondents.

MINES IN ADEYANCE.—Particulars as to address of secretaries and offices, present position, and prospects of the following companies are sought, and any correspondence forwarding them will oblige.—O. and Co.: City, July 12.—West Mostyn Coal and Iron, Welsh Ironworks, East Llanygog, Alt-y-Crib Silver-lead, Bryn Postig Mine, New Bryn Postig Mine, Cwm Yron Lead, Teras Tin, Franco Consols, Bessemer Steel, New Merribent and Middleton, Tyas Mining and Smelting Company, South of Europe Mining, South Cleveland Iron.

GOLD IN WALES.—We hope to publish the valuable paper from Mr. Readwin in next week's Journal.

The London imports of coal in 1879 were 1,000,000 tons heavier than in any previous year. Of the entire shipping tonnage of the world that of the British empire represents about 55 per cent., and the mercantile marine of the United Kingdom exceeds that of all the countries of the world not included in the British empire by a tonnage equal to the entire sea-going marine of the United States, together with the merchant navy of France.

BOILER COMPOSITION.—"F. B. G." (Snarebrook) desires the address of Mr. J. Baker, whose boiler composition was described in the Journal of June 19.

Received.—"E. A." (Dunlop)—"W. L."—"Constant Reader" (Wanstead) should consult a broker respecting the matter about which he inquires; we believe that he is right in his surmise, but he had better seek full information before investing—"M. O. D." (New York)—"A. Holder": We could not publish such a letter without the writer's name being appended—"A. A. R." (Manchester) wishes to know if the prizes for the prize essays on colliery accidents have been awarded—"F. H. S."—"Shareholder" (Wheat Crebor)—"M. C." (Paris)—"F. T." (York)—"Old Hand" (Newport)—"A. G."

The papers on the Iron Ores of County Antrim, and on Mining in Llanarmon, shall appear in next week's Journal.

THE MINING JOURNAL,
Railway and Commercial Gazette.

LONDON, JULY 17, 1880.

FATAL ACCIDENTS IN MINES

THE ROYAL COMMISSION.

It was generally expected that before the close of the present Session of Parliament the report of the Royal Commission on Mines would be placed in the hands of the Home Secretary, more especially as it has to be considered by the Government Inspectors of Mines for their opinions respecting it. This, however, it is now said is not likely to be the case in consequence of the members of the Commission going so minutely into all the circumstances attending explosions in mines, safety-lamps, and the use of gunpowder and other explosives. In the meantime, however, accidents of a fatal character occur in our mines whilst the gentlemen on the Commission are deliberating how to prevent them. Only a few days since three men were killed and five others more or less seriously injured by an explosion of gas at a colliery near to Swansea, in South Wales. The cause of the fatality is said to be the driving into some old workings by one of the miners. This was certainly a preventable accident, for the manager should have been able by his plans to show how far in certain directions the workmen could proceed with safety to themselves as well as others. It would also appear as if naked lights had been in use, or there was a defective lamp, otherwise it is not easy to see how an explosion could take place. Now, the mines in South Wales are of a notoriously fiery character, as has been shown by the many explosions that have taken place in that part of the Principality. In May last, on his attention being drawn to the verdict of the jury with respect to the Llycett Colliery explosion, the Home Secretary said he should give orders to the effect that blasting should be discontinued in fiery mines, agreeable to the provisions of the Act of 1872. Now, if blasting is prohibited in such mines surely it is equally necessary that no naked lights should be allowed where fire-damp is known to accumulate. There cannot well be an explosion without a naked light, hence the necessity for having the best of safety-lamps in mines giving off gas. This brings us round to the point that we would strongly urge—the making known of the views of the Royal Commission if they are of such moment as will prevent accidents from explosions. There does not appear to us to be any reason why the taking of evidence and reporting should occupy two or three years, during which time men are being constantly killed from causes which the Commission was appointed to prevent if possible. The Royal Commission was appointed in the early part of February, 1879, for the purpose of enquiring *inter alia* whether the resources of science could furnish any practicable expedients not now in use calculated to prevent explosions in mines.

Already the members have had nearly 18 months for taking evidence, and it is now said that some months are likely to elapse before the report will be ready. The matter to our thinking is not only most important but urgent, for if by the deliberations of the members of the Commission greater safeguards can be adopted for the prevention of accidents, why not have them brought into operation at the soonest possible moment, and prevent any further loss of life. As it is fatal accidents are of frequent occurrence in our mines, notwithstanding the peremptory character of the Mines Act, whilst miners, mining engineers, and mineowners are anxiously looking forward for the report of the eminent scientific men forming the Royal Commission, from which they have been anticipating so much in connection with the safe working of mines. Whether the report will merely consist of suggestions or material to be embodied in a supplementary Act of Parliament is a question of much importance to those who have invested their capital in mining property. But we are told on the part of the Home Office that the Government Inspectors of Mines will meet and take the report of the Commission into consideration, for the Government it appears will not take action until it has received the report, together with the conclusions of the Inspectors respecting it at their annual meeting. It is, however, doubtful (according to the Under Secretary for the Home Department) whether the report will be ready by the time the Inspectors meet, so that there is no knowing when the public and the parties more immediately interested will be made acquainted with the result of the combined deliberations of the two bodies. The matter is too serious to admit of unnecessary delay, and we trust that an effort will be made by Mr. MACDONALD or some other member of Parliament to ascertain when the long-looked-for report is likely to be ready, or whether another year will be allowed to elapse before we are made acquainted with the best means for preventing fatal accidents in mines.

OUR RAILWAY IRON ABROAD.

We think it is really a fact that the external demand for our railway iron is not exhausted, as some persons may have feared. The late check in the iron trade in the United States, followed as it was by the disastrous collapse of the Philadelphia and Reading Railroad, induced some timid observers to think that we were about to witness a repetition of the great JAY COOKE panic of 1873; but there is more real, substantial, abiding activity now in American business than there was then, and the result has been that matters have continued to move on after all reasonably well. The return to cheaper prices has, no doubt, a tendency to induce a revival in consumption; and we find, at any rate, that the consumption of our rails in the United States proceeded in June upon a very considerable scale. In that month we sent the Americans no less than 34,216 tons of our railway iron, while the corresponding exports to the United States in June, 1879, did not exceed 4834 tons, and in June, 1878, 312 tons. In the first half of this year the United States took our railway iron to the extent of 128,088 tons, while our corresponding exports in the same direction in the first half of 1879 did not exceed 7738 tons, the still smaller total of 464 tons being attained in the corresponding period of 1878. The specially encouraging feature about the returns relating to the exports of our railway matériel to the United States appears to us to be the continuance of the shipments upon a very considerable scale during the last month of the past half-year.

Another circumstance which supports the railway iron trade at the

present is the happy vigour of the colonial demand. Thus our exports of railway iron in June to the four principal colonial groups, compared as follows with the corresponding exports in June, 1879, and June, 1878:—

Colonial Group.	1878.	1879.	1880.
British America	7,364	7,903	18,086
British Africa	1,345	212	1,145
British India	7,349	6,811	22,816
Australia	5,214	3,011	15,842
Total	21,272	17,937	57,889

These figures appear to us to show plainly that prices have a very great deal to do with the colonial consumption of our railway matériel. Upon no other hypothesis can we explain the very large increase which is noticeable in the consumption this year. The colonies all want railways very badly. They have few good ordinary roads, and consequently the necessity for improved communication is imperative. But colonial Governments do not possess the great resources at the disposal of older communities, and they have accordingly to expend their capital with care and economy. Rails have been falling lower and lower for the last four or five months, and the result has been that colonial Governments have been at length tempted to make purchases with a certain freedom. The improvement in the colonial demand will be seen to have been universal this year, and this affords a strong proof that the increase in the consumption proceeds from one and the same cause. The general conclusions which we draw from an examination of the statistics which we have been summarising are highly encouraging. We exported in June this year 100,332 tons of railway iron as compared with 40,992 tons in June, 1879, and 51,198 tons in June, 1878. Figures such as these do not bear out the theories of some American writers, who would have us believe that our industrial greatness is on the wane.

SOUTH AUSTRALIAN COPPER MINES AND RAILWAY.

Some 20 or 25 years ago the inhabitants of Adelaide were electrified by the reports that reached them from explorers in the far north of the discovery of mountains of copper, and lodes of rich ore cropping up to the very surface, that they had paced for 60 paces wide. These wonderful reports subsequently proved to be true. Mining grants were obtained by the fortunate discoverers, and large fortunes were expected to be realised. Among the many mines opened up was the Blinman; that soon raised and sold ore yielding 30 per cent. of mineral to the value of a quarter of a million, and employed a population of 1500 persons. This mine, together with others, was situated some 150 miles from Port Augusta, the nearest shipping place to which the ore had to be conveyed by bullock teams or wagons drawn by six horses, and from whence all stores were obtained, the cost of cartage being from 10*l.* to 12*l.* a ton; this will readily be seen when it is stated that during the dry season two drays loaded with provender for the cattle had to accompany the one conveying the ore. In crossing a creek or getting stuck fast in a rut it frequently happened that much of the ore had to be thrown out to lighten the wagon, and was left behind and lost. The wagons cost about 40*l.* each, and the horses 25*l.* each, so that a team with harness complete would cost about 200*l.* A wagon would only carry 2½ tons, consequently to convey 250 tons of ore per month to the port would necessitate the employment of 100 wagons, representing 4000*l.*, and 600 horses with harness, 17,000*l.*, making in all a total of 21,000*l.* for plant to convey only a moiety of the produce that could be raised at one mine alone. This heavy expense of cartage proved a great drawback, and prevented many of the discoveries being worked; nevertheless, the Blinman raised and sold ore to the value of 250,000*l.*, but the expense of cartage of the ore and stores cost them over 50,000*l.*, and absorbed nearly all the profits.

Wonderful discoveries continued to be made from time to time of further large deposits of rich copper ore, some assaying as high as 70 per cent. of fine copper to the ton; and as the ores of Devon and Cornwall only average about 6 per cent. of metal, some idea of the extraordinary richness of the ores may be gathered when it is also stated that no ore was sold that did not yield about 20 to 30 per cent. The actual cost of raising the mineral was merely trifling—from 3*s.* to 5*s.* a ton. In some instances gunpowder was only necessary to blast out the malleable or virgin copper. It was not mining, but quarrying—for instance, at one mine the ore measured 37 ft.; at another 15 ft.; and at the Blinman 6 ft. wide, of solid ore, from which masses of solid ore of 2 or 3 tons weight were broken, averaging 35 to 60 per cent. without dressing. At another place the walls of the lode dropped up about 3 ft. above the surrounding country as though the soil had been all washed away from it on purpose to serve as a landmark for the miner to go and take its riches away.

It also appears there are other riches besides copper ore in this part of the world. Mountains of marble 30 to 40 miles long are reported. Large masses of iron ore yielding 50 to 90 per cent. of pure metal, as well as ores of bismuth, manganese, lead, silver, and gold. Gems have also been found, diamonds, the white and yellow topaz, corne- lian, agate, amethyst, garnet, and other valuable stones.

In the year 1866 this part of Australia was visited by a dreadful drought that continued for six years, and killed all the cattle, together with 700,000 sheep. The cartage of the mineral came to an end, as no money offered would tempt those possessing horses to run the risk to themselves and cattle of a journey of 150 miles to and from this district. The price of copper ore also fell, and all the mines and explorations were stopped, fortunes vanished, capitalists buttoned up their pockets, miners hearts were broken at being obliged to leave such wealth of mineral, surpassing in richness and extent anything they had ever dreamt of beholding, the mineral rights again reverted to the Government, and Nature's riches remained untouched, as they had done for centuries before.

After the lapse of several years the tradition of this Eldorado was again revived in men's minds, an agitation for a railway was set on foot, and the Government of South Australia was induced to appoint a Parliamentary Committee to take evidence and report what had better be done.

The Committee reported: "Your Committee have to report that they have examined a great many witnesses, and have collected much valuable information relating to the Northern mineral district. Many of the witnesses examined by your Committee are men having much practical experience in mining, and consequently well qualified to give an opinion as to the probable mineral value of the district. It affords your Committee, therefore, much satisfaction to be able to report, that judging from the richness of the ores which crop out to the surface in numerous places over a very large area of country, there can be scarcely any doubt that in the northern country—having Port Augusta in the south for a shipping place, to beyond Mount Rose (200 miles) in the far north—this colony possesses a mineral district of the most valuable character. The character of the ore, wherever it has been raised, is described as being of the most valuable sorts—virgin or native copper, grey sulphuret, red oxide, green and blue carbonate, and malachite. The evidence does not show that any yellow sulphuret or other low percentage ores, such as the Cornish and Devon lodes principally consist of, have been met with; but your Committee need not inform you of the well-known fact that in working and raising these rich ores a vast quantity of mineral must necessarily be brought to grass which would reduce the average percentage of the bulk considerably."

However, nothing further was then done, and several years slipped away, until some gentlemen having taken up the former mineral leases that had reverted to the Government another agitation was made for a railway, and the Government appointed another Committee, who reported:—

"Your Committee, in the prosecution of their enquiry, have examined various witnesses, and have received documentary evidence. The whole evidence goes to show that the country in the far north is exceedingly rich in mineral deposits, and offers a rare opportunity for the profitable investment of capital. It is in evidence that one mine alone (the Blinman) is supporting a population of 1500 persons, and that if facilities of transit were offered there are many mines of equal, and even superior, value that could be immediately and profitably worked."

Mr. AUSTIN, in his work on the Mines of South Australia, alluding

to the same district after a personal inspection of the several coveries says:—"With this important auxiliary (the railway) the successful working, wealth almost unimagined may be developed, and employment found for thousands of persons."

In the meantime, the colony having become rich and prosperous the Government decided to construct the railway itself, at a cost upwards of a million sterling, and having in view the large quantities of ore and agricultural produce that will be sent to Port Adelaide requiring accommodation for shipment, have also decided to construct a long line of large wharves, 4500 ft. in length, and leasing the same to the several mineowners and others at the rate of 5 per cent. per annum on the cost of construction. 100 miles of the railroad is already made to Edouard, and the 100 miles is under contract to be completed by October, 1881.

South Australia is known throughout the world for its tremendous copper mines—the Moonta and the Burra Burra. The former having paid in dividends upwards of 1,024,000*l.*, and the latter 800,000*l.* on an original capital of only a few hundred pounds. In short time we may now expect to hear of the development of the Moontas and Burra Burra Mines in the far north, and no many mines will now be worked that will yield large fortunes, the ores can be so easily raised and are reported to be far richer than the ores of the above mentioned mines.

Chill produces more copper ore than all the rest of the world together, but according to one witness examined by the Commission the output from this favoured mineral district is likely to be enormous. Chill altogether as far as production goes. The mineral riches of Australia appear to be equally distributed over the island. In the south copper is abundant; in Victoria gold preponderates; in New South Wales coal is found.

THE WYNAAD GOLD MINES, SOUTHERN INDIA.

In connection with the recent movement for the development of the gold deposits of the Wynaad district the case of Harris and Fleming (which really affects many of the Indian gold companies already formed) was again before Vice-Chancellor Hall on Tuesday. It will be remembered that this was an action in which Mr. R. Harris, of Redruth, the discoverer of the gold mining property in India, seeks for a declaration that under an alleged agreement partnership, made between him, Mr. Mathew Morton, and the firm of W. Nicol and Co., of Bombay, he became entitled to a third of the profits arising from the acquisition of the Wynaad Estate, and other gold mining properties in the Wynaad district, South India, and for accounts against the defendants on that issue. He also sought for an injunction to restrain the defendants from carrying into effect an agreement made in April of last year whereby Mr. R. P. Harding, acting for the trustees of the firm of Nicol and Co., agreed to sell to the Indian Gold Mines Company (Limited) the properties in question, unless such agreement was carried out upon the footing that he was entitled to one-third of the profits arising from such properties. An application was made on the day last made to the Vice-Chancellor, Sir C. Hall, for the appointment of a special examiner to take at Bombay the evidence of the defendants, Messrs. John Fleming and Hamilton Maxwell, that a writ in the nature of a mandamus might issue to the Judge of the High Court at Bombay for the examination and examination of those defendants, and that the trial of the case might be postponed until the return of the depositions or of the Mr. W. Pearson, Q.C., and Mr. Everitt appeared in support of application, Mr. Graham Hastings, Q.C., Mr. F. C. J. Miller, and Mr. Warrington appeared for the plaintiff, Mr. Edwin Harris resist the motion, and Mr. Cracknell appeared for the defendant Mathew Morton.

It appeared from affidavits which had been filed on behalf of plaintiff that the contract was made by the plaintiff with the defendant, Hamilton Maxwell, whilst in India alone, and that there was of the utmost importance that the defendant, Hamilton Maxwell, should be personally examined before the Court, so that the Court might judge of the demeanour of the witness in the witness box; the sole question in the case being whether the plaintiff's defendant was more worthy of credence as to what took place at interview when the joint adventure was made, and this was the issue raised by the pleadings. His Lordship, after hearing on at considerable length, decided that since the Judicature Act Courts were now more than ever disinclined to allow the evidence to be taken in any other way than orally before the presiding judge who tries the cause, and that in this case he considered it of greatest importance that he should have the evidence of the defendant, Hamilton Maxwell, taken before him; and as the affidavits filed on behalf of the defendants did not show sufficient reason for the examination of the defendants, John Fleming and Hamilton Maxwell, upon the commission, he dismissed the application with costs.

THE MINERAL STATISTICS OF VICTORIA.

For the first time for many years the Minister for Mines (MR. ROBERT CLARK) is able to report that the estimated yield of gold for the year from Victorian mines bears a favourable comparison and is slightly in excess of the yield for the preceding year, and adds that the gradual development of the newly discovered alluvial lodes at Ballarat, and the improved yield from lode mines at Maldon and other places, together with the assistance rendered by the Government diamond drills, will it is hoped, have a beneficial effect upon mining enterprise, and lead to a further increase in the returns of gold for the current year. The important results entirely from the alluvial workings. The quantity of quartz raised from the mines during 1879 is estimated at 889 tons, against 874,717 tons in the preceding year; but the estimated yield of gold was 906 oz. 10 dwts. more than in 1878. The gold obtained from alluvial mines 289,754 oz. in 1877, against 261,450 oz. in 1878, and 293,310 in 1879; and the quantity obtained from lode mines was 519,899 oz. in 1877, against 493,587 oz. in 1878, and 465,637 oz. in 1879. The yield of gold per ton of stuff treated not materially varied. The average earnings of the mines were 76*l.* 1*s.* 3*d.* per man per annum in 1879, against 82*l.* 13*s.* in 1878, and 82*l.* 6*s.* 2*d.* in 1877. The number of Chinese engaged in alluvial workings on Dec. 31 was 9110, being a decrease of 528 as compared with the preceding year. The total area occupied as mining ground under the provisions of the by-laws of the several mining boards 36,552½ acres on Dec. 31, 1879, against 37,746½ acres at the corresponding date of the preceding year; and the area held under lease from the Crown was 18,316 acres, against 16,840 in the preceding year.

With regard to metals and minerals other than gold it is reported that during the past year no silver ore has been raised, but 6 dwts. of silver have been parted from gold obtained in St. Armand district: 23,680 oz. 15 dwts. of silver were parted from gold smelted at the Melbourne Mint. The total yield, therefore, of silver for the year was 23,729 oz. 1 dwt. The silver exported during the year amounted to 2082 oz. The tin ore and black sand raised during the year amounted to 24 tons, of which only 5 tons were smelted, being 70 per cent. of tin, and 34 tons 10 cwt. were exported. According to returns received 3862 tons of copper ore were raised during the year, and 4228 tons 6 cwt. were smelted, from which were obtained 1 cwt. 1 q. 7 lbs. of regulus were obtained; and there were exported 335 tons 19 cwt. of copper and 225 tons 15 cwt. of regulus. There were raised during the year 495 tons 15 cwt. 3 qrs. 14 lbs. antimony ores, and 169 tons 16 cwt. 2 qrs. 12 lbs. were smelted from which 68 tons 10 cwt. of regulus were obtained, and 15 tons were exported 153 tons of ore and 245 tons 17 cwt. of regulus. There was no lead ore raised. About 120 tons of iron ore were raised, which were smelted, and produced 52 tons of metal, gypsum 6 tons were raised. No coal was raised, but during the year 1353½ tons of lignite were obtained. Of flagging 2102 tons 184 cwt. were quarried.

The prospects of mining appear to be altogether brighter. The report of Major COUCHMAN, on which the Minister's statement is based explains that for the first time during the last 11 years the estimated yield of gold from alluvial mines shows an increase

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of the preceding year, due principally to a better water supply in the operations, and to the opening up of deep mining ground in the district of the auriferous drifts. But, owing to the exhaustion of the auriferous drifts, the older workings of the gold fields, it is hardly to be expected that the yields from this class of mining will show any lasting improvement. There is still a slight falling off in the yield from quartz. The past year shows no alteration in that respect from those of the last year and of the year 1878 are comparatively small. However, to quartz mining that we have to look hopefully for progress, and it is confidently anticipated that the recent discoveries of extensive and highly auriferous quartz veins at Ballarat, and in the deep alluvial leads so long and profitably worked on that gold field, together with a great improvement in the methods of vein mining at Maldon and other places, will cause an increase in the yields from this class of mining for the current year.

THE SPANISH LEAD DISTRICTS.

The fluctuations in the output of the Spanish lead mines take people by surprise because they have no means of estimating the causes which underlie them, the United States Iron Age, therefore, gives an account of them to the end of 1877. The two most important districts of Spain are those of Linares and Cartagena, the former situated on a southern spur of the Sierra Morena in the province of Andalusia, on a tributary of the Guadalquivir, the latter being in Linares dates back to the times of the Phoenicians, Carthaginians, and Romans, being attended with varying success until they were almost completely abandoned soon after the discovery of rich mines in America, the king decreeing that no mining should be done in Spain, a measure probably designed to force the development of the richer transatlantic mines. During the middle of the 18th century the state undertook to work the largest deposit of the district, that of Arroyan, and since then operations have always continued. It was not, however, until foreign (chiefly English) capital was employed in the district, and railway communication with Madrid, Seville, and the coast was opened, that it rose to its present importance. The Linares district extends two miles north of the city, in a south-easterly direction for about 7½ miles, having a width of about 5 miles. It is, therefore, comparatively small. The chief rock of the region is a close-grained granite, which is partially decomposed, in close proximity to the veins, to a depth of over 100 ft. It frequently crops out, especially toward the north, but considerable areas are covered by a series of strata, the geological horizon of some of which has not been accurately determined. The ore dressing yields three grades of material—galena running from 76 per cent. to 80 per cent. of lead; so-called carbonates (although they do not contain carbonates) assaying from 35 per cent. to 40 per cent., and fine ore running from 60 per cent. to 70 per cent. The carbonates are almost exclusively shipped to the coast for export to Germany. The second great lead-producing district of Spain is that of Cartagena, which some decades ago occupied the first rank. The lead ore deposits of the Sierra de Cartagena, east of the town of that name, had, like those of Linares, attracted the attention both of Carthaginians and Romans, whose activity in mining is shown by innumerable piles of slag. No work of consequence was done until 1840. In 1842 three smelters turned out a few tons of lead, but during the succeeding years the output continued to grow until 75 works turned out, in 1862, 17,478 metric tons of lead, while 68 smelters made 17,753 tons in 1873. It is stated that their number increased to 100 in 1877, which produced 35,000 tons of lead. The main reason why mining in the Cartagena district has fallen off is that the claims are, as a rule, very small, and the holders find it impossible to undertake important work of development. When the large "crestones" were being worked this did not signify much, but now that systematic work, requiring capital and experience must be done, they are incapable of advancing. The only point favouring them is that the lead ore is much richer in silver than that of the Linares district, averaging as it does from 50 ozs. to 80 ozs. per ton. Under the present system—or, rather, lack of system—the Cartagena district must continue to lose ground. It is only by the evolution of foreign capital that its resources, which still appear to be great, can be made largely available.

GOLD MINING IN INDIA.

With regard to the prospects of dividends being earned upon the capital embarked for the development of the gold fields of the Wynaad district, it must be admitted that those resident in the locality are much better able than any can be in this country to form a reliable opinion, and it is, therefore, gratifying to learn that the reports from the neighbourhood of the mines are without exception encouraging. The South of India Observer points out that it is nearly 30 years since the Hon. Mr. Duncan, Governor of Bombay, sought vainly to procure information respecting the auriferous resources of Malabar. At various times since enquiries have been made, but without throwing much light on the most important question—whether or not the mines would prove remunerative. Of course, being a matter for the consideration of Government a committee was appointed whenever pressure was brought to bear on the administration, but the committees did harm rather than good. The members were entirely ignorant of gold mining, and accordingly they, as ignorant persons invariably do, decided all vexed questions quickly and authoritatively. The researches of Mr. Sheffield and Lieut. Nicholson in 1831 have recently been noticed in the *Mining Journal*, and their want of success threw the matter into abeyance until about 15 years ago, when Mr. H. L. Sterne, who had had some gold mining experience in Australia and California, set out on a general prospecting expedition in the Wynaad, seeking for gold or any other metals or minerals which could be turned to profitable account. Mr. Sterne without assistance, and probably not acquainted with the modes of occurrence of gold in ancient metamorphosed rocks, so different from the Silurians of Australia or the Jurassic strata of California, did not meet with so much success as to enrich himself, but he proved beyond doubt that the Wynaad was an auriferous country. For nearly 10 years subsequent to Mr. Sterne's explorations but little was done by prospectors, the Alpha Gold Mining Company being then formed. They erected a 15-horse battery, and with insufficient engine power, lack of proper arrangements in placing the plates and tables, and a general disregard of all the precautions necessary in attempting to save the precious metals, they nevertheless were able to obtain gold from 30 tons of quartz at the rate of 2 dwts. 8½ grs. per ton. The mill was then leased to the Prince of Wales Prospecting Company, and they crushed 322 tons of quartz with an average of 10 dwts. 12 grs. per ton, besides picking out specimens which were sold for about 120l. These results were sufficient to attract attention, and the reports of competent authorities called in to inspect showed clearly that the gold in the Wynaad was worth further attention. A gentleman now in India, who was at that time a member of the Viceroy's Council, procured the appointment of Messrs. R. Brough Smyth and Thomas Taylor as chief and assistant mining engineers, and in July, 1878, they set to work in the Wynaad. For a long time but little was known of the results of their observations and labours. Occasionally it was rumoured that they had found a rich gold field, but nothing was allowed to transpire. At length in 1878 his progress report was published, and for the first time the public and the Government became aware of the hidden wealth of the Wynaad. His final report, which has been republished in London, has established confidence. He has given tables of yields of numerous parcels of quartz from some 40 separate reefs; he has shown on a map lately published outcrops of quartz reefs over an area of about 350 square miles, and has shown that in Australia a yield of 1 dwt. 16½ grs. per ton will, under economy and under favourable conditions, cover all expenses; and that from 2 dwts. to 3 grs. will give a profit. Engineers are being employed in several localities near Devalah. Some of these gentlemen have been engaged in gold mining for over a quarter of a century, and their experience and knowledge will be a great gain to the country. Machinery for crushing and treating quartz is being

landed, and we shall soon, perhaps, ascertain what the aggregate yield of gold will be when (say) 400 or 500 stamp-heads are at work. The aggregate capital raised up to the present time is probably not far short of 1,500,000l., and considering that a larger sum than that is invested yearly in Australia in gold mining adventures, it is not an unreasonable amount, more particularly as the right to mine for gold in India has to be acquired either from the Government or from Zemindars.

It is not unreasonably estimated that with skill, care, and good machinery, the output of gold in India will not be less per stamp-head than that of California or Australia. Mr. Brough Smyth has indicated the localities of ancient native workings and quartz reefs over an area extending from Nellambur on the south to Nellacotta on the north, and from near Gudalur on the east to Vellarymulla on the west. Prospectors are at work still further westward, and from specimens tested in the laboratory gold has been got in quantities sufficient to encourage further research. Probably at and beyond Vythery auriferous veins will be discovered. More than this, gold has been found on the west coast in South Canara, where Mr. Brough Smyth has lately been; and the reefs at Nanjanad, only six miles from Ootacamund, are thick and highly pyritic, the yield of gold from some parcels being as high as 6 dwts. and 7 dwts. per ton. There is scarcely an acre of ground at Devalah or near the reefs at Nanjanad which has not been "washed" again and again by the native miners in ancient times. As regards the soils, these are "worked out" gold fields, but the reefs and veins, the depositories of the gold, remain, and to them attention is now directed. To what extent the Government will assist this new enterprise by framing simple, just, and easily understood regulations, what kind of a front it will present under somewhat difficult and novel circumstances, and whether any one in the employment of the Government has the knowledge and experience which are so requisite in dealing with gold-mining and gold miners time alone will show.

THE PANAMA CANAL.

Although from the time of Charles V. to judge from a letter of Fernando Cortez to that monarch, the importance of intercommunication between the Atlantic and Pacific by way of the Central American isthmus, has been fully recognised; it is only now that the practical details necessary for securing that advantage have been really obtained. It appears from the Bulletin du Canal that Mr. Vallée, of the National Library, has collected in a highly interesting volume the letters of Fernando Cortez to Charlemagne, in one of which the conqueror of Mexico mentions to the Emperor that he was sending expeditions to find the strait which was supposed, according to Christopher Columbus, to exist across the isthmus, and pointed out the great advantage which that route would present as compared with the Straits of Magellan. He was deeply indebted, and all necessities were dear, notwithstanding the richness of the country, whilst the taxes did not meet the expenditure, yet he borrowed money and was about to spend 10,000 piastres to send off three caravels and two brigantines to discover the strait. There were other projects which he contemplated carrying out "in the month of July of this year 1524," but he added that he should neglect everything in order to discover the strait, which he regarded as of paramount commercial importance.

But the desirability of the communication between the two oceans being admitted, there remains the important question whether the natural facilities for carrying out the work justify it being undertaken, and whether it can be done within a reasonable time. Upon both these points the facts collected are most encouraging. The supposed insalubrity of the climate is said to be entirely imaginary, as M. de Lesseps proved by going there with his family, and he has found that the canal can be made without resorting to locks or a tunnel. The length of the canal to connect the Bay of Limon with the Bay of Panama will be 73 kilometres, and the quantity of ground to be removed (including the rectification of the Chagres) is calculated at 75,000,000 cubic metres. This it is estimated could be done in six years, reckoning 250 working days per year, and the employment of 8000 men, capable of handling 50,000 cubic metres per day; that is rather more than 8 cubic yards per man per day, with the machinery and motive-power necessary. Accepting these figures as correct there are really no insurmountable obstacles to overcome, and the enterprise promises to be far more remunerative than the Suez to those embarking their capital in it.

ROYAL SCHOOL OF MINES.

At the annual meeting of the Council of the Royal School of Mines the Prizes and Associateships were awarded as follows:—
The Edward Forbes Medal and Prize of Books to H. M. Platnauer.
The De la Beche Medal to John Green.
The Murchison Medal and Prize of Books to H. M. Platnauer.

ASSOCIATES—MINING AND METALLURGICAL DIVISION.

E. B. Lindon (1877-80).
P. W. S. Menteath (1864-5 and 1878-80).
Ralph G. Scott (1877-80).

MINING DIVISION.

John Greene (1877-80).
B. Mott (1876-80).
H. E. Tredercroft (1872-76, and 1879-80).

METALLURGICAL DIVISION.

R. S. Benson (1877-80).
J. J. Berringer (1877-80).
D. B. Bird (1877-80).
H. S. Cotton (1877-80).
W. Cross (1877-80).
W. L. Grant (1877-80).
G. S. Grundy (1876-80).
C. L. Higgins (1877-80).
B. McNeill (1878-80).
T. H. Reeks (1877-80).
James Taylor (1871-4 and 1878-80).

GEOLOGICAL DIVISION.

H. H. Hoffert (1876-80).
H. M. Platnauer (1877-80).

COLLIERY MANAGERS' CERTIFICATES.—The results of the last examination for certificates of competency as colliery managers, have just been received from the Home Office. The examiners were Mr. G. C. Greenwell, Tynemouth; Mr. C. G. Jackson, Chamber Colliery, Oldham; and Mr. N. B. Griffiths, Wrexham. There were 22 candidates, and the following have been successful in passing the examination:—Henry Cook, Haydock, St. Helens; C. Cockson, Wigan Coal and Iron Company, Wigan; R. A. Booth, Onell Mount, Wigan; John H. Darby, Brymbo, near Wrexham; T. R. Davis, Adwy Clawdd, Wrexham; Charles Fergie, Ince, Wigan; T. D. Grimke, Swinton, near Manchester; Henry Headley, Coppal Colliery, near Mold; John Knowles, Ince, Wigan; R. B. Mawson, Rose Bridge Colliery, Wigan; John Roughley, Thates Heath, near Prescott; A. E. Webster, Wigan Coal and Iron Company; Samuel Gregory, Hawarden Colliery, near Chester.

GOVERNMENT STEELMAKING.—Mr. Walter Ness, who has lately been making experiments at Woolwich and elsewhere in this country, with a view to the utilisation, for the Indian Government, of the iron ore and coal of the Chardra district of the Central Provinces, has now gone to America in pursuance of the same investigation. The iron ore is rich, and the coal is poor and sulphurous. The fuel will not smelt the ore in the usual way, and it is sought to first reduce the ore to an iron sponge, and then melt in crucibles. Treated in this way, excellent tool-steel is the result; but the sulphur imbibed from the coal makes the steel unfit for railmaking. By a free use of lime the sulphur difficulty may be largely overcome, but an out-turn of 5 cwt. a day only would not be commercially profitable. By his journey to America, Mr. Ness hopes to secure a furnace which will permit of a larger output; or one that will otherwise enable the

Indian Government to efficiently utilise the minerals which, in the Central Provinces, they possess in practically unlimited quantities.

ARTIFICIAL DIAMONDS.

It will be fresh in the memory of some of our readers that a few months ago a statement was made to the effect that diamonds had been artificially produced in Glasgow by a process not yet divulged, and that, having been examined by the highest chemical and mineralogical authorities, the new gems had been found to satisfy all the conditions hitherto alone supplied by the diamonds from Nature's own laboratory. When, however, it became known that the new diamonds were almost microscopic, and that a gem worth 10s. cost 5l. to make, the interest in the subject somewhat diminished. It has, however, revived on the publication by Mr. G. B. Hannay, in the recently-issued number of the "Proceedings of the Royal Society," of the precise method by which he obtained his startling and novel results. And if only as a record of indomitable perseverance against ever-increasing difficulties, of scientific acumen, and of the true application of the Baconian method of research, it is worthy of study. Some idea of the nature of the investigation may be obtained from the fact that out of eighty complex and expensive experiments only three succeeded. Violent explosions were frequent; furnaces were blown to pieces; steel tubes burst, scattering their fragments around. On other occasions tubes which had been carefully prepared, filled, welded, and nested in a reverberatory furnace for many hours, were found to have leaked, and spoiled the experiment. "The continued strain on the nerves," writes Mr. Hannay, "watching the temperature of the furnace, and in a state of tension in case of an explosion, induces a nervous state which is extremely weakening, and when the explosion occurs it sometimes shakes one so severely that sickness supervenes."

The diamond-making experiments were started in September, 1879, when Mr. Hannay made many attempts to find a solvent for the alkali metals, sodium, potassium, and lithium. But in no instance could such a solvent be found which did not in the gaseous state, and under pressure, unite with the alkali. Even in the case of hydrocarbons, such as paraffin spirit containing only hydrogen and carbon, the alkali combined with the hydrogen, setting free the carbon. Now, as we know, diamond is pure carbon; hence, when this element was set free from a pure substance, it was thought that conditions of pressure and temperature might eliminate it in the hard, crystalline, adamant form—as diamond. Glass tubes were first employed, but although of great thickness in comparison with their bore, they were found to be insufficiently strong, and they were replaced by wrought-iron tubes 20 in. long by 1 in. diameter, and having the diameter of the bore ¾ in. In these lithium was heated for many hours to a high temperature in paraffin spirit, and on subsequently opening the tube carbon in a hard form was found within it. Great difficulty was experienced in getting the tubes perfectly air-tight, and eventually the open end was welded, at a white heat, and by that means alone did it resist leakage. Sometimes tubes would burst with an explosion like a gun. A tube 20 in. long by 2½ in. diameter and ¾ in. bore, was filled with a hydrocarbon made from bone oil, to which some charcoal powder was added in order to keep an excess of carbon in the tube. Its open end was welded, and it was heated for 14 hours, with lithium. On opening it a quantity of gas appeared and some minute pieces of hard carbon which had evidently separated out from solution. Another similar tube burst at the end of 8 hours' heating. A tube of cast-iron no less than 3½ in. diameter, and with a bore of only ¾ in., exploded at the end of an hour with a fearful report, wrecking the furnace. Several tubes of steel also burst under the enormous pressure, at last shattering the top of the furnace. The author remarks that in nature the temperature must at one time have been much higher than anything we can now produce artificially; while the pressure obtained at a depth of 200 miles below the earth's surface is greater than that which any of the materials from which we can form vessels can resist.

We come now to the great experiment which resulted in the artificial production of veritable diamonds. A tube 20 in. long by 4 in. diameter, of coiled Lowmoor iron, was bored so as to have an internal diameter of ½ in. Thus the central bore was surrounded by walls of iron, 1½ in. thick, and of course capable of resisting an enormous pressure. In the tube was placed a mixture of 90 per cent. of rectified bone oil, and 10 per cent. of paraffin spirit, together with 4 grammes (about 62 grains) of the metal lithium. The open end of the tube was welded air-tight, and the whole was then heated to redness for 14 hours, and allowed to cool slowly. On opening it a great volume of gas rushed from the tube, and within was found a hard, smooth mass adhering to the sides of the tube. "It was quite black, and was removed with a chisel, and as it appeared to be composed principally of iron and lithium it was laid aside for analysis. I was pulverising it in a mortar when I felt that some parts of the material were extremely hard—not resisting a blow, but hard otherwise. On looking closer I saw that these were most transparent pieces imbedded in the hard matrix, and on triturating them I obtained some free from the black matter. They turned out to be crystalline carbon, exactly like diamond." Such is Mr. Hannay's account of his discovery. Subsequent chemical and optical analyses have proved that these hard shining crystals are in every respect true diamonds. The cost is obviously great; so also is the danger to life and property; and the great difficulties to be overcome render disappointments common. What we now want is to get vessels of a material sufficiently strong and non-porous to resist the high pressures and temperatures upon which the success of the experiment depends. What we have learnt, among other things, from the brilliant researches of MM. Cailletet and Pictet, which led to the liquefaction of the so-called permanent gases, and from Mr. Hannay's experiments described above, is that we must push the forces of nature to their utmost strain by using our most powerful mechanical devices for producing pressure, our strongest materials for resisting it, and our intensest means of producing both heat and cold. Never was the Baconian aphorism—"occulta naturæ magis se produunt per vexationes artium quam cum cursu suo meant"—more applicable than to experiments of the nature of those which Mr. Hannay has so ably carried out, and which have led to the production of a substance which had hitherto kept the secret of its formation securely shut up in the bowels of the earth.

GOLD MINES IN JAPAN.—From a consular report just issued, it appears that three gold mines are now being worked at Shimo Aikawa, in the island of Sado. They were first discovered in 1613, since which time they have been steadily worked by manual labour until 1869, in which year machinery was introduced by the Government. The main shaft is sunk to a depth of about 600 ft., and two of the mines are connected by a gallery 3000 ft. in length. First-class ore contains from 50 to 2000 yen worth of gold per ton (one yen equals 4s. 2d.). The ore is crushed at the top of the mine, reduced to powder by stamps, and ground up with mercury into an amalgam, which is distilled and afterwards made into gold and silver ingots. Silver and lead are also obtained from the ore, the latter being collected into a mass of some 20 tons, cupelled by a German furnace, and the bullion extracted and made into ingots. In 1878-9 the amount of ore reduced was 6428 tons, yielding 2195 ozs. of gold and 91,713 ozs. of silver, at an expenditure of 85 per cent. Altogether, the Government has spent 334,570 yen in erecting machinery, and the total loss during the ten years has been 240,126 yen. Upwards of 1080 persons are employed, including 120 women for ore-picking. The daily output is 20 tons, and about the same quantity is reduced at the works, which consist of four smelting furnaces, one German cupelling furnace, six amalgam pans, ten stamps, two concentrating presses, two steam-engines, one copper refinery, one assay room, and twelve coke kilns, and this plant is about to be still further increased by the present superintendent.

HERCULEAN LEVER WHEEL.—A new wheel, which it is considered will be very useful in connexion with colliery trains and tramway cars, as well as in its application to flywheels, cranes, &c., has been invented by Mr. W. J. Brewer, formerly of Bombay, and is now being manufactured by Messrs. Bailey and Co., of Manchester. The invention is of an extremely simple character, the principle of it being

the same as that of the cog wheel. The ordinary wheels of all wheeled conveyances, instead of being placed in a box, are kept in position by vertical guides. The axles of the main wheels are worked upon by the patent lever wheels, the axles of which are in a box directly above, and in the same guides supporting the ordinary wheel, the spring of the vehicle being attached to the lever wheel. As soon as any motive power is applied to the vehicle in which the lever wheel is fixed, it immediately sets it in motion, and thereby saves an extra force usually required to support a vehicle. Mr. Brewer claims that the invention can be fitted easily and with little cost to any vehicle, and that it will effect a saving of at least 50 per cent. in the motive power. It appears that with the patent wheel a carriage of a given weight can be started with half the usual power. A block, constructed on the same principle, was tried on board the ship James Aiken, lying in the harbour at Bombay. The result showed that the best American patent roller block required from nine to ten men to hoist a bale of cotton, while with Brewer's patent block it only required five men, thereby saving half the motive power.

COMPARISON BETWEEN THE AVERAGE COSTS OF THE PRODUCTION OF IRON IN FRANCE AND IN ENGLAND.*

In the course of a report drawn up on behalf of the Commission of the Chamber of Deputies appointed to consider the suitability of the rate of duty of 6 frs. per 100 kilograms, proposed to be charged on malleable iron imported into France, the author discusses at some length the relative costs of production of bar-iron in France and in England.

He estimates that English coal costs on the average 6.25 frs. per ton at the pit's mouth, and French coal 11 frs., and that, at the same time, French coal of average quality is so much inferior for smelting purposes to English coal that 1600 kilos. of it are needed, as compared with 1350 kilos. of English coal, to make a ton of coke; and the coke contains 12 to 16 per cent. of ash, against 6 per cent. only in England, so that 1200 kilos. of it, instead of 1100 kilos. only, are required in the blast-furnace per ton of pig-iron made. In the cost of the coke only that is used in the blast-furnace the expense of making pig-iron in France thus exceeds that of making it in England by more than 12 frs. per ton. France it is estimated is at a further disadvantage in the cost of carriage of the iron-making materials to each other or to the works. This is owing in part to the fact that iron ore and coal lie much further apart in France than in England, and in part to the want in the former country of a more complete system of canals, so that the materials have to be conveyed to a great extent more expensively by rail. It is assumed that the cost of the labour required in iron making is the same in both countries, and that the cost of the ore at the mine, and its average richness, and the cost of fluxes are also the same; but the author remarks that in the richness of its ores and in the proportion of lime that must be smelted with them for fluxing, on account of their siliceous character, France is also in truth at a disadvantage as compared with the competing countries. The following is a summary of the relative costs of production of cast and wrought iron in the two countries, noting only the items of expense in respect to which they differ. In France the works that produce pig-iron convert it also habitually into wrought-iron. In England, on the contrary, the pig-iron is more commonly carried to a point nearer to the collieries, to be there made into wrought-iron. Hence in this estimate the carriage of the coal used is charged as part of the cost of making pig-iron into wrought-iron in France, and the carriage of the pig-iron as part of the cost in England.

1.—Production of pig-iron:—		England.	
France.	Frs.	England.	Frs.
Coke, 1200 kilos., at 20-60 frs.	24-72	Coke, 1100 kilos., at 11-45 frs.	12-60
Carriage of this coke, at 1 fr.	9-60	Carriage of this coke, at 4 frs.	4-40
Carriage of 3 tons ore, at 3-50 frs.	10-50	Carriage of 3 tons of ore, at 1 fr.	3-00
Total of these items	44-82	Total of these items	20-00
Difference in favour of England, 24-82 frs. per ton.			
2.—Conversion of pig-iron into wrought-iron:—		England.	
France.	Frs.	England.	Frs.
Pig-iron, 1400 kilos., at 42-32 frs.	62-73	Pig-iron, 1400 kilos., at 20 frs.	28-00
Coal, 2500 kilos., at 11 frs.	27-50	Coal, 2500 kilos., at 6-25 frs.	15-63
Carriage of this coal, at 8 frs.	20-00	Carriage of the 1400 kilos. of pig-iron, at 4 frs.	5-60
Total of these items	110-23	Total of these items	49-23
Difference in favour of England, 61 frs. per ton.			

Germany and Belgium are at a greater advantage than England in their cost of producing iron, as though their coal is no better than French coal labour with them is 30 per cent. cheaper. Thus the average cost of coal in Belgium being 8 frs. per ton, and in Germany 6 frs. per ton, the difference in the cost of production of bar-iron, as compared with that in France, is estimated to be 63-10 frs. per ton in favour of Belgium, and 73-48 frs. per ton in favour of Germany.

France is at even a greater disadvantage as compared with foreign countries in the production of high-class charcoal iron than in that of coke iron, and the make of this class of iron in the country has fallen off from 90,654,000 kilos. in 1859 to 21,100,000 kilos. in 1877, a quantity only equal to that imported in the same year. The difference between the cost of production of charcoal bar-iron in France and in Sweden is not less than 120 frs. per ton.

— By M. DANIELLE-BERNARDIN: Revue Industrielle.

* From JAMES FORREST'S "Abstracts of Papers in Foreign Transactions and Periodicals," for the Proceedings of the Institute of Civil Engineers.

CHEMICAL PURIFICATION OF SMALL COAL.

In treating small coal for the manufacture of coke or for agglomerated fuel, the washing of the coal is usually effected with water, but this gives such incomplete results that it is in many cases applicable. Mr. CHARLES TELLIER, of Paris, proposes to wash the coal in solutions sufficiently strong to effect the separation of the inert matters, instead of employing simple water as hitherto. He states that all liquids which are sufficiently dense to allow the coal to float therein may be employed, but he prefers to employ solutions of chloride of calcium or of magnesium, as these possess the advantage of being low in price and easily dissolved in water in any proportions, and of forming solutions of sufficient density for effecting the separation of the inert matters. This separation may be facilitated when working with coal of great density by giving a rapid circulation to the washing liquid either in a vertical or horizontal direction, but this circulation will be rarely required.

In practice the invention involves two principal operations—the separation of the inert matters, and the recovery of the separating liquid drawn off by the substances operated upon. For separating the inert matters he throws a quantity of coal in a bath of chloride of calcium at 45° (which is the degree he has found to give good results, but which may be varied), and immediately the coal will be seen to separate into two parts, the light part floating to the surface, whilst a portion of the mass operated upon will fall to the bottom of the receiver; this part is the waste product, and its proportion will vary from 10 to 15 or 16 per cent. according to the quality of the coal. On the commercial scale a cistern with bituminous walls (for preventing it being attacked by the liquid employed) is dug in the ground or built above it by means of suitable walls of sufficient strength and resistance. The lower part of this cistern terminates in the form of a cone, which communicates with a pump so constructed as to be able to work, whatever be the quantity of solid matter drawn off, and it is by means of this cone and pump that the waste products are drawn off. The proportion between the delivery of the pump and the volume of the waste products to be extracted may be estimated as one to five. The coal may be treated in pieces of any uniform size, but as lumps contain crevices enclosing foreign matters, it is preferable to break up the coal in such a manner as to entirely expose these foreign bodies. Any kind of apparatus may be used to reduce the coal to uniform size, which coal is admitted through a hopper into the separating bath in which the heavier matters go to the bottom, whilst the light ones float. This operation may be facilitated by the action of an agitator kept constantly in motion, so as to disseminate the matters, whereby the lighter portions are driven towards the edges, or a rotating and diverging bottom may be used to force them out and escape with the current of chloride which is constantly overflowing. It will thus be seen that the inert matters escape at the bottom part in a current of chloride, whilst the coal escapes in a current of chloride at the upper part.

In both cases the mass drawn off falls on a flat surface of wire cloth or of perforated sheet metal, the chloride passing through the holes, whilst the separated matters on either side are drained on an inclined surface, which conveys the drained solution to an ordinary draining well, from which it is drawn by a special pump and conducted to the cistern. By this arrangement it will be understood that the action is constant, and the waste products are collected on one side, and on the other side is collected the coal which has been purified as much as possible. These matters, however, contain chloride, which it is necessary to separate therefrom—first, because if it cost anything whatever the process would not be commercially practicable; and, secondly, because it would interfere with combustion. The chloride solution is used over and over again, and the quantity of water used is also very small.

WATSON BROTHERS' MINING CIRCULAR.

WATSON BROTHERS,
MINEOWNERS, STOCK AND SHARE DEALERS, &c.
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

We have not lost faith in the eventual success of D'Eresby Mountain, and had we money to spare would buy all the shares we could get at the price named by our correspondent. The delay in getting under the ore discovered in the great stope has been great but unavoidable. It has also been expensive, and when Capt. Waters inspected the mine he recommended sinking the Gorse shaft (which has been done and is now 15 fms. below the No. 5, or deep adit), and then to drive about 30 fms. to get under the ore, by which means it could be worked more efficiently and cheaply. To do this work it was necessary to put up a small engine to pump the water from the shaft up to No. 5. All this has been done, and the No. 6 level driven nearly 3 fms., and it will be pushed on through the softest part of the lode (at 44. per fm.) as quickly as possible. The agent writes us this week in reference to it, "I can state without fear that if the lode in the No. 6 prove to be only the very same in value as at No. 5 we shall have a mine which can be profitably worked for many years to come." Although the Gorse shaft was sunk 30 fms. away from the rich stope at No. 4 (and proved at No. 5), and the agents are driving in the soft part of the lode for expedition and cheapness, good ore was found in the shaft in the hard part, and the presumption is that it continues from the stope to the shaft, and a cross-cut will be put out to prove this shortly. The sub-division of the shares is at the request of some of the largest shareholders in the mine, and few mines are better held.

On referring to Mr. Watson's "Cornish Notes" in 1861, which first appeared in the *Mining Journal* and then in pamphlet form, we find the following remarks in reference to Wheal Crebor; they show its position and the objects we had in view 19 years ago, just after we had joined the new company:—"Wheal Crebor, a sett large enough for two or three mines. A former company spent 20,000l. in working the northern part of the sett. The present company have been sinking Cook's shaft in order to get into the vein of ore ground which some years ago yielded 150,000l. of copper ore between two cross-courses and dipped away east. Cook's shaft is now down 60 fms. below the adit of 10 fms., &c., &c." Bedford United, to the westward, then paid 48,000l. dividend, and was making 300l. per month profit. The whole district was also alive with mines. The discovery of a lode, or an improvement in the Bridge lode of Bedford, which runs through Wheal Crebor well to the north, has taken place, and orders have been given to search for it in Wheal Crebor.

Thomas Tremar, of Horrabridge, would make himself out a very disinterested person indeed. He does not, he says, own a single share in Wheal Crebor, has no personal motive to serve, but out of pure philanthropy comes forward to correct erroneous statements made in regard to the mine! In this we would join him if we knew of any, but when his strictures are principally directed to the "roseate hue" of the meeting caused by a dividend fairly earned and declared in accordance with the Cost Book System, and by a report made for the committee by an authority such as Capt. Rich, of South Condurrow, we are tempted to ask him "Thomas Tremar" ever inspected the mine himself, and when? If his object were truly to check "reckless speculations in mines without sufficient information" he might, perhaps, cast his eyes elsewhere to some purpose. But we question the philanthropy that singles out such a mine as Crebor for animadversion, especially when it is known the shares have been heavily "beared" not so very far from Horrabridge.

A correspondent cannot understand how it is that while new schemes without machinery or certain prospects are being "worked up" to several pounds per share Carnarvon shares remain quiet. Now, we do not care to make comparisons, which, as Mrs. Malaprop says, are always "odorous," so we will only say Carnarvon is a *bona fide* property, with all its machinery (erected at great cost) complete, will stand upon its own merits eventually, and does not require puffing now. It is, as we have often said, only 80 fathoms deep, and has returned 100,000l. worth of ore. The pump winze in the bottom of the 80 has a lode in it worth 4 to 6 tons per fathom, and the cross-cut from the 90, at new shaft, is nearing this sump, and will unwind it, and enable the ore to be got at. From this week's report it will be seen that the 90 end, going towards this sump, looks well, and there is the prospect of a new mine altogether in the mountain. When we add to this that the company have in hand upwards of 4000l. clear of every liability a correspondent may make comparisons for himself.

It is generally assumed that the amounts placed as "paid up" in the Share Lists on last page of the *Journal* are correct, and if another correspondent will point out any errors to the Editor no doubt they will be attended to.

It is a singular thing, considering why the "barrier" or neutral ground, was marked out between South Frances and West Bassett, that both mines should have broken into it, and each have become liable to a penalty of 500l. The riches of these two mines in tin seem to have as great perversity in keeping near the boundaries as they had in copper, when some 20,000l. were spent in law by the two mines. And it was to prevent further litigation and disputes that the "barrier" was drawn and a penalty of 500l. attached to breaking into it.

In the former dispute the boundary between the two mines was marked by a cottage belonging to one John Vincent. From the north-east corner of the cottage to the south or front corner there was a width of about 30 feet, and one of the richest lodes in the district had the perversity to run under the very cottage. The South Frances claimed their boundary as in a line with the north-east corner of the cottage. The West Bassett claimed their boundary line at the south corner. So that both mines claimed this piece of ground, 30 feet wide, and in which ore to the value of 20,000l. was supposed to exist. And to get it they went to law, and the suit was carried on with great bitterness for several years, at a cost of 20,000l. or 30,000l., and eventually decided by the House of Lords. We did our best at the time to calm down the West Bassett people, and in May, 1861, we attended a meeting of South Frances, inspected the cottage and plans, and expressed the opinion that two practical and disinterested parties might have settled the question in a few hours; but the fight went on nevertheless. At that time too the mine was getting into its transition state from copper to tin, and was poor. Some time afterwards a large number of shares was actually relinquished.

NEW PENROSE TIN AND COPPER MINING COMPANY.—The directors have given notice that consequent on the numerous applicants for shares in the company the share list will close on Monday next for Tuesday's allotment, therefore anyone desirous of securing shares should apply not later than by Monday's post. Active operations have already begun at the mine, so that the fine weather may not be lost. The prospects of this property are highly thought of by practical men in West Cornwall, and under the management of Messrs.

Thompson and Sons, of Plymouth, and Capt. J. Curtis local mine is likely to be developed into a paying concern.

TREATING ORE AND REGULUS.

In connection with the treatment of ores of copper, silver, nickel, and zinc, and of reguluses of the first four (zinc being found in any regulus) Mr. WILLIAM HENDERSON, of Irvine, proposes an improved method of obtaining these metals in solution as reguli. If the ores contain a notable proportion of magnesia, lime, or other earthy matter, and silica, he converts them into a regulus of not more than 50 per cent. copper by smelting in the way as is well understood by copper smelters. If nickel or cobalt, or both, are present a sufficient amount of arsenical pyrites should be added previous to smelting to prevent these metals passing into slag. When the ores do not contain much alumina, or alkali, or silica, this smelting operation may be dispensed with. The regulus are now calcined in the usual way to drive off the arsenic and arsenic, and leave the metals as near as practicable in the form of oxides.

The calcined or burnt ores and regulus are now mixed with a variable proportion (according to the amount of metal converted into soluble sulphates) of bisulphate of soda, or technically known in commerce as nitre-cake. This should be previously crushed to a coarse powder and then intimately mixed with the oxidised ore or regulus, and crushed to pass through a sieve about the fifth or sixth of an inch clear mesh. The mixed ore and bisulphate are now transferred to a calcining furnace and subjected to a low red heat with repeated stirrings and turnings over. In a short time it will be found that the copper, silver, cobalt, nickel, and some other metals of rarer occurrence are converted into soluble sulphates. The calcination is continued until this has been effected. The charge is then withdrawn and lixiviated, and the metals separated from their solutions in the usual way. If silver is present it is necessary to use water free from chlorine or chlorides. The phosphate of soda may be recovered from the residual solutions by evaporation and crystallisation. Burnt cupreous pyrites may be treated in the same way without previous calcination if well burnt. Phosphate of potash and other bisulphates may be substituted for the sulphate of soda, wholly or in part, but he prefers soda-salt by reason of its cheapness and low chemical equivalent carrying a large portion of available sulphuric acid.

Original Correspondence.

UTILISING WASTE BESSEMER METAL.

SIR,—So much loss and annoyance have been caused through ends, old rail bars, and many waste forms of old and new Bessemer steel that makers of Bessemer metal generally will be glad to hear that a cheap and thoroughly practical process has been invented by Mr. W. T. Block, of Hannibal, Missouri, for double heating and rolling two or more pieces into a homogeneous mass to be wrought into merchantable forms. Any suitable forms of Bessemer steel—for example, as rail bars—are reduced to uniform lengths with reference to the purpose to which the finished product is to be applied, and arranged in a convenient and practical form on the bed of a heating furnace, forming a pile without any bands or ties between, and consisting of as many pieces as may be desired. Having completed this first stage of the process, which may resemble the ordinary use in the art if ties or bands are not used therein, a second stage is commenced, which is the first heating, and continues until the pile has reached, or nearly reached, the weight for this metal, which is the more readily obtained and perfectly distributed where rail bar or similar forms are used in the pile, being no filling to obstruct free play of the heat or to draw from intensity.

Care must be taken to prevent any such increase of heat as will be sufficient to burn the steel. The pile is now ready for the second heating prior to the removal to the hammer or rolls. The doors of the heating furnace are opened, thus tempering the heat, and a sufficient quantity of iron turnings (those from wrought-iron produce the best results) are thrown into it and over the pile and bed of the furnace. The workman then proceeds with the second heating, busseling by rolling the pile over the turnings on the bed of the furnace, the fagots being now in a sort of temporary weld sufficient strong in bond to keep together in form. The turnings which pile gathers up, together with those already thrown over it, will increase heat at this stage; and, secondly, they assist in the welding under the hammer or the rolls. The pile, after having reached the end of the third stage, second heating, is ready to be put under a hammer or through a train of rolls after the manner obtained in the ordinary course practised in the art. Any other furnace may be used to carry out this process where the degree of heat can readily be regulated and controlled. In handling the instruments common to the trade are employed.

July 13.

SOUTH WHEAL CREBOR.

SIR,—In handing you this week's report of South Wheal Crebor I beg to observe that everything is progressing most satisfactorily in the mine. The lamentable and fatal accident stated in *London papers* to have happened here, occurred at East Crebor on Tuesday last. The shaft at South Crebor is some 30 fms. higher above the river than is that at East Crebor. It is, therefore, not possible for such an accident to occur at South Crebor.

Guilford Chambers, July 16. J. SMITH, Secy.
[For remainder of Original Correspondence see this day's Supplement.]

FORTESCUE (Stannagwyn Mine).—The following is the result of assays of ores from this mine, made by Mr. M. Bawden (Liskeard) and Prof. White (London):—

MIXED UNDERESSED ORES FROM NEAR SURFACE.	
Arsenic	11½ per cent.
Copper	6½ "
Tin	A trace.
Silver	8½ ozs. per ton.

If these rough stones were properly dressed as a sample for the market they would yield a high percentage.

NO. 1 MIXED ORE FROM SHALLOW WORKING.	
Tin	12-12 per cent., or 25 lbs. per ton.
W. WHITE Copper ... 3-20 "	" 334 "
(London). Arsenic ... 10-50 "	" 224 "
Silver	8 ozs. 16 dwts. 9 grs. per ton of stuff.
No. 1 tinstone from bottom of shaft contains 448 lbs. per ton.	
(Signed) M. W. BAWDEN	

LEAD ORES.	
Date. Mines. Tons. Price per ton. Purchasers.	
July 13—Isle of Man	100 £12 14 0 Mining Co. of Ireland
16—South Darren	50 14 13 6 "

COPPER.	
Date. Mines. Tons. Price per ton. Purchasers.	
July 16—South Darren	22 £7 2 6 Nevill, Druce, and Sons
ditto	33 2 15 0 Vivian and Sons

MR. W. H. H. WATSON, DEALER IN MINE SHARES
at the net market prices of the day.
Address—1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

FOR SALE:—
25 Hornachos, £5 5s. 20 Glenroy. 30 Prince of Wales.
1000 Devon Copper and 25 Van Consols and Glyn 25 Parys Mountain.
Blende, 1s. 6d. Amalgamated. 100 Tyn-y-Fron.
20 East Caradon, £1 5s. 20 ditto Preference. 50 East Crebor.
50 Bedford United. 25 Wheal Coates. 20 East Van.
60 West Caradon. 10 Wheal Crebor.
Address, H. WILKINS, 3, Haybourn Villas, Tottenham.

JULY 17, 1880.]

TO COLLIERY PROPRIETORS.
WANTED, TO PURCHASE, MONTHLY SUPPLIES of OLD
PIT PROPS and SLEEPERS.
Best price per ton and quantity to "Timber," Box 163, Post Office,
London.

LEAD AND SILVER SMELTING.
WANTED, ONE or TWO CAPITALISTS to JOIN
ADVENTURERS in the ABOVE BUSINESS. Most eligible premises
secured on advantageous terms. Highest references given and required.
Address, "Lead and Silver," MINING JOURNAL Office, 26, Fleet-street, E.C.

TO COPPER PYRITES MINING COMPANIES,
AND OTHERS.

WANTED, by the Advertiser (who has had the Management of
Copper Pyrites Mines in Spain for the last seven years), a SITUATION as
CAPTAIN at home or abroad, the latter preferred.
Thoroughly acquainted with the Management of Men, Dialects, Mapping,
mining, has had long experience at keeping of accounts, and is proficient
in Spanish language. Age Thirty-four. Unexceptionable references and
qualifications. "Mining Engineer," care of Mr. G. Wilkins, Winscombe, near Weston-
super-Mare.

WANTED, a PURCHASER for a LEAD MINE situated in one
of the most productive and progressive lead mining districts in NORTH
WYKES, partially developed, and capable of making immediate returns. Ends
valued at 16 yards from surface valued at from 1 to 2 tons per fathom.
Address, "Lywina," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

WANTED, an EXPERIENCED LEAD SMELTER, to
SUPERINTEND the LEAD-SMELTING DEPARTMENT of WORKS
VALLEY. It is essential that he has had experience in the treatment of low-
refractory lead ores in cupolas, and been accustomed to management of
furnaces, with references, "X," Post Office, Swansea.

WANTED, a PARTNER (active or otherwise) with £4000 to
join Advertiser in a well-established IRONWORKS, working a speciality
in making good profits. Good opportunity for a Gentleman wishing to put a
business. None but principals need apply. Good references given and
required. "A. B.," W. H. Smith and Sons' Bookstall, London-road Station,
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RESIDENT MANAGER.
THE ORCONERA IRON ORE COMPANY (LIMITED) is RE-
QUIRING for the WORKS and MINES at BILBAO, SPAIN, a gentle-
man to take the position of RESIDENT MANAGER. He must have good ad-
ministrative abilities, possess a knowledge of Iron Ore Mining, and be com-
petent with the Spanish language. Salary not to exceed £500 per annum.
Apply, by letter only, to the Secretary, at 79, Queen Victoria-street, London.

FOR SALE—SLATE QUARRIES.
TO BE SOLD, the TYN-Y-WERGLLOD SLATE QUARRIES,
situated in NANTLE VALL, in the county of CARNARVON, together
with the WORKING PLANT belonging thereto.
For particulars, apply to W. W. TOMLINS, 4, St. Ann's Square, Manchester.

VALUABLE SLATE PROPERTY FOR DISPOSAL.
THE ADVERTISER, having DISCOVERED a LARGE VEIN
of BLUE SLATE, of excellent quality, and upwards of a mile in length,
passing through his property, would be disposed to OFFER FAVOURABLE
TERMS for the WORKING OF or DISPOSAL OF SAME.
Apply, in the first instance, to "A.," MINING JOURNAL Office, 26, Fleet-street,
London, E.C.

CIVIL AND MINING ENGINEERING.
A YOUNG MAN, who has had a first-class course of training as a
CIVIL AND MINING ENGINEER, for a period of six years, desires to
ENTER into PARTNERSHIP with a Gentleman who may require such an ad-
vise in his business.
Apply, "W. A.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

SURVEYS, VALUATIONS, PLANS, &c., &c., of MINERAL and
other PROPERTIES executed on the shortest notice. ERECTION of
BUILDINGS, WINDING, and LEAD-DRESSING MACHINERY on the most
improved principles. SPECIAL "LEWING" MACHINES, &c.
Estimates, &c., carefully considered, by ALFRED WILLIAMS,
Greenfield, Van Lee Mines, Llanidloes, and Amlwch, Anglesea.

MINE AND CIVIL ENGINEER (THEORETICAL AND
PRACTICAL) desirous of ENGAGEMENT. Abroad preferred. Had
extensive experience in British Colonies, United States, South America. Mines,
quarries, and other work. Speaks Spanish. Foreign and English references.
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NORTH MOLTON MINING COMPANY
(LIMITED).

HAVE STILL TWO HUNDRED AND TWENTY-FIVE shares
of £1 each, fully paid, in the above valuable property FOR SALE. Will
be sold on an immediate purchase to clear.
Address, J. WILSON, 7, Cumberland-terrace, Finsbury Park, N.

EAST CHIVERTON SILVER-LEAD MINE.
SELLERS OF SHARES in the above, state number FOR SALE and
best price.
Address, "S. B.," care of Chapman and Coole, Auctioneers, Valuers, and
Estate Agents, 31, Lamb's Conduit-street, W.C.

MR. W. B. COBB, STOCK AND SHARE DEALER,
29, BISHOPSGATE-STREET, LONDON, E.C.

Business transacted in every description of Stocks and Shares. Fortnightly
accounts opened on receipt of usual cover.
BANKERS: ALLIANCE BANK (Limited).

MINE "EL CALLAO,"
GUAYANA, VENEZUELA.

COUPONS OF SHARES 322
GOLD IN BARS.—Produce in the month of January, 1880, remitted Ozs.
Messrs. Baring Brothers and Co. 3337.11
The Treasurer of the Company, The President of the Company,
G. BARNEWITZ. A. SICCIONI.

MINE "EL CALLAO,"
GUAYANA, VENEZUELA.

COUPONS OF SHARES 322
GOLD IN BARS produced in the month of February, 1880, and re- Ozs.
mitted to Messrs. Baring Brothers and Co. 4098.62
Dividend distributed in the month of each coupon \$100
The Treasurer, The President of the Company,
G. BARNEWITZ. A. SICCIONI.

THE MONA MINE
(LIMITED).

Notice is hereby given, that the Directors have this day DECLARED an
INTERIM DIVIDEND OF TEN SHILLINGS PER SHARE on the 8000 shares
of the Company, payable free of income tax, on and after the 31st July next.
The Transfer Books will be closed from July 24th to the 31st inclusive.
By order, W. J. LAVINGTON, Secretary.
14a, Austin Friars, London, E.C., 14th July, 1880.

THE NEW PENROSE TIN AND COPPER MINE COMPANY
(LIMITED).

This property was reported by the late Sir R. Murchison and Sir Henry de la
Beche, F.R.S., with proper development, would class with the richest in the
country. The company is now actively engaged in developing the mine. From
seven holes alone seaward over £111,000 worth of copper was sold. The sett contains
seven holes—three of tin and four of copper, making, with each other, twelve
intersections, besides lead and iron lodes, and a valuable bed of china stone, and
all in maiden or unwrought ground, but amply proved to the eastward.
Full and detailed prospectuses, reports, and application for shares should be
made to the Managers, THOMPSON and SOXS, 14, Old Town-street, Plymouth.

THE NEW PENROSE TIN AND COPPER MINE COMPANY
(LIMITED).

Capital £12,000, in shares of £1 each; deposit 2s. 6d. per share on application.
The major portion of these shares having been applied for, NO APPLICATION
for SHARES will be ENTERTAINED after MONDAY, the 19th inst.
Prospectuses, containing full particulars, with reports, names of directors, &c.,
from the Secretary and Managers, Messrs. THOMPSON and SOXS, 14, Old Town-
street, Plymouth. An important feature is that the mine has been already started
to work.

MESSRS. J. TAYLOR AND CO
MINING ENGINEERS AND INSPECTORS.

88, LONDON WALL, LONDON, E.C.
Have Agents in England, Scotland, Wales, and on the Continent.
BUSINESS in VIREBERG Shares.

HOW TO MAKE MONEY.—An invaluable guide to persons
of capital. The publication contains much reliable information for in-
vestors, and some special recommendations sure to succeed. By acting accord-
ing to the prescription money must be made.
Published by THOMPSON and SOXS, 14, Old Town-street, Plymouth.

In the High Court of Justice—Chancery Division.

JONES v. CHORLEY.
CEFN CAM SLATE QUARRY, MERIONETSHIRE,
Equi-distant about nine miles from Dolgelly and Barmouth.

THE PROPERTY covers an area, including the LANDS attached, of about 380
acres, and comprises a WHARF on the River Mawddach, a manager's house,
a smithy, store room, barracks for about 50 men, and other necessary buildings.
The slate is of good quality, of excellent colour, hard, and durable, and of
capital cleavage; held from the Crown for a term of 30½ years from the
5th April, 1862, at a rental, now payable, of £100 per annum, merging into a
leasehold of 12th. By a judicious outlay in improving the transit or the con-
struction of a tramway and opening the quarry there is every probability that
it might be made a profitable concern. With possession.

MR. BENTLEY JAMES BRIDGEWATER (of the firm of
Messrs. Debenham, Tewson, Farmer, and Bridgewater) WILL SELL
the ABOVE, at the Mart, on Tuesday, July 27, at Two o'clock.
Particulars of Messrs. BARRELL, KIDWAY, and BARRELL, Solicitors, 11, Lord-
street, Liverpool; of Messrs. LAST and SON, Solicitors, Albert Buildings, Queen
Victoria-street; and of the Auctioneers, 80, Cheapside, where an extract from
the lease and a plan of the property, as well as specimens of the slates, can be
seen.

TO BE SOLD, BY AUCTION, pursuant to an order of the High
Court of Justice, Chancery Division, made in an action BURNABY v.
BOULTBEE, 1853, D 85, with the approbation of Vice-Chancellor BACON, by
MR. WM. TAYLOR (the person appointed by the said Judge), at the George Inn,
Alfreton, in the county of Derby, on Friday, the 30th day of July, 1880, at
Twelve o'clock at noon, all that

VALUABLE MINERAL AND FREEHOLD ESTATE
Belonging to the Trustees of the Will of the late Sir WILLOUGHBY WOLSTAN
DIXIE, Bart., and situate in the parishes of SELSTON, Nottinghamshire, and
ALFRETON and CODNOR PARK, Derbyshire, as shown on the surface and
mineral maps accompanying the particulars and conditions of sale.

The MINERALS will be offered FOR SALE in One Lot apart from the surface.
Underlying the estate are all the well-known seams of COAL and IRONSTONE
worked by the adjoining collieries, which are the most valuable seams in Derby-
shire and Nottingham, including the TOP HARD, MAIN SOFT, DEEP HARD,
FURNACE, and BLACK SHALE. The lower seams are practically untouched,
and extend under about FIVE HUNDRED AND EIGHTY ACRES. The upper
seams, with the exception of the Top Hard, occupy about FOUR HUNDRED
AND FIFTY TO FIVE HUNDRED ACRES. The schedule accompanying the
particulars and conditions of sale specifies the quantity of each seam believed
to exist. The workings of the Pinxton, Riddings, and Mexboro' Collieries with
new pits recently opened in the neighbourhood approach and pass through the
various beds of the mineral map.

The FREEHOLD SURFACE consists of about SIX HUNDRED AND THIRTY
ACRES OF LAND, comprising many farmhouses, homesteads, and outbuildings,
cottages, and excellent building sites, especially in the neighbourhood of
the railway stations of the Midland and Great Northern Railways, where no other
land is available for building purposes, and also adjoining to the new pits sunk
in the southern part of Selston, where such accommodation is greatly wanted for
the increased population.

Lot 1 comprises the MINERALS, which will be offered first in One Lot.
Lots 2 to 75 comprise about SIX HUNDRED AND THIRTY ACRES OF FREE-
HOLD LAND, divided into Lots of from EIGHTY to FORTY ACRE FARMS,
down to small plots suitable for building.

There are many lots laid out expressly to suit the wants of building societies, &c.
The railway accommodation is unequalled, no less than five railway stations
of the Midland and Great Northern Railways lying on or close to the estate,
securing rapid and cheap communication; while the excellent new roads laid
out by the Enclosure Commissioners across all parts of the parish of Selston have
greatly enhanced the value of all property in this neighbourhood.

Particulars and conditions of sale, with plans of estate, surface and mineral,
may be had on application of Messrs. FREER, REEVE, BLUNT, and ROWLAND,
Solicitors, Leicester; of Messrs. MILES and TAYLOR, Friar-lane, Leicester; of
Messrs. AUSTEN, DE GEX, and CANDLER, Solicitors, 4, Raymond's Buildings,
Gray's Inn, W.C.; of Messrs. PRATT and HODGKINSON, Solicitors, Newark; of
Messrs. CREE and SON, Solicitors, 13, Gray's Inn-square, London, W.C.; and of
Mr. J. W. Selston, near Alfreton; and of the Auctioneer, Bowling
Green-street, Leicester.

DENBIGHSHIRE.
PARISH OF RUABON.

PRELIMINARY ADVERTISEMENT of intended SALE, BY
AUCTION, at the Queen's Hotel, Chester Railway Station, on Saturday,
the 28th of August, 1880, at Two for Three o'clock in the afternoon, in One or
more Lots, as may be arranged, of A VALUABLE FREEHOLD RESIDENTIAL
ESTATE, known as

"GARDEN,"
Situate near the town and within a mile of the first-class Great Western Railway
Station of Ruabon, and within easy distance by rail or road of the towns of
Wrexham and Llangollen.

The Estate lies within a ring fence, and comprises the excellent gentlemanly
residences of "GARDEN LODGE" and "PENYGDARDEN," with extensive
outbuildings, gardens, pleasure grounds, and plantations, and several COT-
TAGES and excellent pasture, arable, and wood LANDS, and a VALUABLE
QUARRY of FREESTONE, and contains in the whole about 160 acres.
At the same time, it is intended to OFFER FOR SALE the VALUABLE
SEAMS and VEINS of COAL, IRONSTONE, and other MINERALS underlying
the Estate, which are in lease to and actively worked by a company.

Adjoining the Estate are the properties of Sir Watkin Williams Wynn, Bart.,
William Cornwallis West, Esq., Henry Dennis, Esq., and others, and the turn-
pike-road from Wrexham to Ruabon forms the north-eastern boundary.

Plans and particulars are in course of preparation, and may shortly, with any
other information, be obtained from
Messrs. CURTON, ELPHOCK, and CO., Auctioneers, Chester; or from
Messrs. LONGUEVILLE, JONES, and WILLIAMS, Solicitors, Oswestry.

VALUABLE COLLIERY FOR SALE IN YORKSHIRE,
working the well-known BARNSELEY THICK COAL.
Apply, J. and P. HIGSON, 18, Booth-street, Manchester.

ITALY—VALUABLE MINING PROPERTY.

THE PROPRIETOR of a VERY VALUABLE SILVER-LEAD
MINE in ITALY is desirous of meeting with a party to join him, with
capital, or with the view to FORMING A COMPANY, to take over and work
the mine on a larger scale. The greater part of the purchase-money would be
taken in shares.

The mine is well explored, developed, and is now in full work. Has first-rate
dressing-floors, worked by steam and water power; very good houses for man-
agers and workmen; and considerable landed property. The ore sold to the
foundries has given 38 per cent. of lead, with 150 ounces of silver and 1 ounce of
gold per ton of ore.

The mine is situated close to the high road, and only two and a half miles dis-
tant from the railway stations, and offers to capitalists an unusually good oppor-
tunity for highly profitable enterprise.
Apply to "P. B.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

FOR SALE (nearly new), ONE DIRECT-ACTING PATENT
COMPOUND STEAM PUMP; will lift 6000 gallons of water 600 feet high
per hour; 7 inch double-acting pump rams, coated with gun metal; two high
pressure steam cylinders, 11 inches diameter; low-pressure steam cylinder,
24 inches diameter, stroke 2 feet; space occupied 14 feet 6 inches by 5 feet 2 inches;
speed, 30 strokes per minute; steam pressure, 50 lbs. per square inch. Only
worked six weeks at Outwood Colliery, near Manchester; had to be replaced with
a larger pump. Price, complete, delivered on rails Bradford, £250—immediate
delivery.

FOR SALE, ONE NEW SHOLL'S PATENT PNEUMATIC
STAMP, for Tin Ore, Gold Quartz, &c.
Price and particulars on application to THWAITES BROTHERS, Vulcan Iron-
works, Bradford, Yorkshire.

FOR SALE, a FIRST-CLASS SECOND-HAND 80 in. CORNISH
PUMPING ENGINE, with several 11 ton BOILERS.
Apply, WM. BENNETTS, Roskear, Camborne.

TO CAPITALISTS AND INVESTORS.—
LADY ASHBURTON SILVER MINING COMPANY (LIMITED), at par
£1 2s. 6d. per share.

FLINTSHIRE GREAT CONSOLS (LIMITED), at £1 7s. 6d. per share.
BETTS-Y-COED LEAD MINING ASSOCIATION (LIMITED), at £1 5s.
per share.

ONLLWYN and DULAIS COLLIERIES (LIMITED), at £5 4s. per share.
SOUTH WHEAL CREBOR (LIMITED), at £1 10s. per share.
For particulars on the above properties, apply to—
JOHN HANTING ROGERS,

ST. CLEMENTS' HOUSE, LOMBARD STREET, LONDON, E.C.
Monthly Investment Circulars post free on application.

TO BE LET, BY PRIVATE TREATY, THE GRASSINGTON
LEAD MINES, near Skipton, Yorkshire.
Address, The Devonshire Offices, Carleton, Skipton.

TO BE LET, THE CONONLEY LEAD MINES, near Skipton.
Address, The Devonshire Offices, Carleton, Skipton.

TO BE LET, upon Royalty, a VEIN OF LEAD ORE, situate
in MONTGOMERYSHIRE, a few miles from some of the most productive
undertakings.
Apply to Mr. ARTHUR HIND, Mining Surveyor, Bilston, Staffordshire.

PIT SINKING, WINDING COAL, PUMPING, &c.

PORTABLE STEAM ENGINE FOR SALE, with two 13½-inch
cylinders, fitted with link-motion reversing gear, large boiler, with or
without road travelling wheels, and winding and pumping gear.
Also a double 9½-inch cylinder PORTABLE ENGINE.

A 9½-inch cylinder VERTICAL ENGINE, with winding drum, complete.
An 8-inch cylinder VERTICAL HOISTING ENGINE, with winding drum
complete. To be seen at—
BARROWS and STEWART'S WORKS, BANBURY, OXON.

TAME VALLEY PAPER MILLS

(LIMITED).

STALYBRIDGE, NEAR MANCHESTER.

CAPITAL £60,000, in 6000 SHARES of £10 EACH.

This concern, which is new and fitted with the most modern ma-
chinery, has been acquired at about half its original cost, and is
offered on very advantageous conditions.

Prospectuses may be had from Messrs. J. R. and W. P. BAINES,
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DALBEATTIE GRANITE WORKS.

MR. M. C. SMITH has retired from the firm of Messrs.
SHEARER, SMITH, AND CO., and Mr. W. FIELD has
joined Mr. Shearer and Partners. The style of the firm is now
MESSRS. SHEARER, FIELD, AND CO., who are prepared to
quote for all descriptions of GRANITE for ENGINEERING and
BUILDING PURPOSES. PAVING SETTS, CURBS, &c., and
POLISHED WORK SEA or RAIL to all parts.

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SCIENTIFIC MINING ENGINEER AND GEOLOGIST (of
Thirty Years practical experience) is OPEN to INSPECT
MINING PROPERTIES, and GIVE BONA FIDE and RELIABLE
OPINION, or REPORT, upon reasonable terms.

Apply to "Mining Engineer," Somerset Chambers, Corn-street,
Bristol.

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SAFE DIVIDEND TIN MINE SHARES FOR SALE:—
5 South Frances, £13 15s.; 11 Wheel Jane, £4. Sold to close a trust account.
No reasonable offer refused.
Mr. DOBELL, Solicitor, Truro.

A RICH LEAD SETT in CARDIGANSHIRE FOR SALE, or
the CO-OPERATION of some Gentlemen or a Good Firm required to
FORM A COMPANY. Rich ore discovered, set extensive, and abundant water
power. In the best district, with easy royalty, adjoining a turnpike road.
Address, Mr. JAMES G. GREEN, Engineer, Bow-street, R.S.O., Cardiganshire.

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ROYAL ROUTE VIA CRINAN AND CALEDONIAN CANALS
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OBAN, NORTH and WEST HIGHLANDS.

Official Guide Book, 2d.; illustrated copy, 6d.—see bill, with Map and Tourist
ares, free, at Messrs. CHATTO and WINDUS, Publishers, 214, Piccadilly, London;
by post from the Owner, DAVID MACBRAYNE, 119, Hope-street, Glasgow.

STOCK AND SHARE INVESTMENTS.—Important information
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This day, 12mo., limp cloth 4s. 6d., or cloth boards 5s. (postage 4d.)

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MANUFACTURE and DISTRIBUTION OF COAL GAS.

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MINING AGENTS AND ENGINEER,
VALPARAISO AND SANTIAGO,
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W. TREGAY, Mining Engineer, REDRUTH,

Having many years' practical experience in Metallic Mines, is
prepared to INSPECT, REPORT, and ADVISE on every description
of MINERAL PROPERTY.

CAPTAIN ABSALOM FRANCIS, M.E.,
GOGINAN, ABERYSTWITTH.
CWM PRYF: This is the great prize in silver lead mining for 1880. If the
25,000 shares are issued and the properties offered are added and developed, which
can be accomplished in 12 months, shares will be worth and will go to £10. See
report weekly in *Mining Journal*.—June 17, 1880. ABSALOM FRANCIS.

PENNINGTON AND CO., SWORN BROKERS,
3, ROYAL EXCHANGE BUILDINGS, E.C.

Transact business in every description of Stocks and Shares.

ESTABLISHED 1869.—BANKERS: ALLIANCE.

P. and Co. advise immediate purchase of TREVINCE CONSOLS Shares at
12s. 6d., and will forward every information on application.
SPECIAL BUSINESS in Gold Coast, Tollima A. New Gold Run Ten per Cent.
Preference, New Cathedral, and Devonport and Tiverton Brewery shares.

HORACE J. TAYLOR, STOCK AND SHARE DEALER,
38, GREAT ST. HELEN'S, LONDON, E.C.

(Late of the PORT PHILLIP AND VICTORIA MINING COMPANIES.)

Mr. TAYLOR has DEALINGS in the undermentioned:—
100 Almada & Tinto. 100 Eberhard & Aurora. 100 Rossa Grande.
100 Bedford United. 100 East Caradon. 100 Victoria (London).
25 Consolidated. 100 Festarena. 25 West Devon Consols.
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SPECIAL BUSINESS in BILCH UNITED MINES, also WHEAL COATES
UNITED MINES.

BANKERS: CENTRAL BANK OF LONDON (Limited).

MESSRS. THOMPSON AND CO.,
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BANKERS: ROYAL EXCHANGE.

Business transacted in every description of Stocks and Shares.

Messrs. T. and Co. still advise the purchase of TREVINCE CONSOLS shares at
present almost nominal price of 12s. 6d., as a great rise is certain to take place
very shortly.

COPPER ORES.

Sampled June 30, and sold at Swansea, July 13.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce.	Price.
Betta Cove.....145	73½	£4 0 0		Caveira.....90	8½	£4 12 0	
ditto.....145	73½	4 2 6		ditto.....91	8½	4 14 0	
ditto.....143	73½	4 4 6		ditto.....90	8½	4 17 0	
ditto.....143	73½	4 4 6		Berehaven.....74	10½	5 16 6	
ditto.....135	73½	4 1 6		ditto.....74	10½	5 17 6	
ditto.....103	73½	3 19 6		ditto.....37	11½	6 10 6	
Caveira.....103	73½	3 19 6		Burnt Ore.....135	2½	0 15 0	
ditto.....103	73½	3 18 6		Sobral.....71	15½	8 16 6	
ditto.....102	73½	3 18 0		ditto.....10	14½	8 6 6	
ditto.....91	8½	4 11 6		Italian.....31	15½	8 13 6	
ditto.....91	8½	4 11 0		Copper Ore.....3	31	18 6 0	

TOTAL PRODUCE.

Betta Cove.....846	£2473 4 6	Sobral.....81	£209 18 6
Caveira.....781	3317 10 0	Italian.....31	268 18 6
Berehaven.....185	1107 4 0	Copper Ore.....3	54 18 0
Burnt Ore.....135	102 0 0		

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company.....	140	£ 574 2 6
Nevill, Druce, and Co.	181	852 16 6
Vivian and Sons.....	181	828 1 0
Williams, Foster, and Co.	707	3,323 5 6
Landore Copper Company.....	834	3,455 6 6
Total.....	2043	£ 9,033 12 0

NO SALE on July 27.

21 cwt. Produce. Price. Per unit. Standard

Whole sale ... 2043 ... £ 4 8 5 ... 10s. 11d. ... £21 1 10



PARIS, 1867. MEDAL.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH, 1867. MEDAL.

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10, 28'30, 27'10, 28'40, 28'70 metres. Total advance of south heading during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere ($7\frac{1}{2}$ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL; and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

These Machines possess many advantages, which give them a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL USE THROUGHOUT THE WORLD FOR MINING, TUNNELLING, QUARRYING, AND SUB-MARINE BORING.

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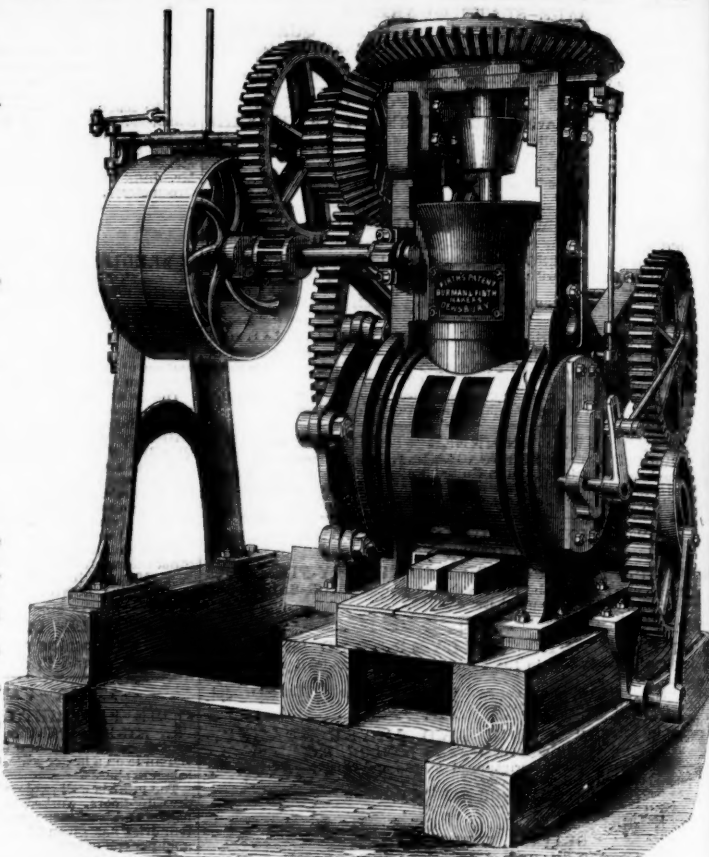
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It makes two bricks at once, and will make 12,000 to 14,000 Plastic Pressed Bricks per day, hard enough to go direct to the Kiln without drying; or it will make the bricks thoroughly plastic if required. For Works requiring a Machine at less cost the Machine is made to turn out one brick at once, and is capable of producing 8000 bricks per day.



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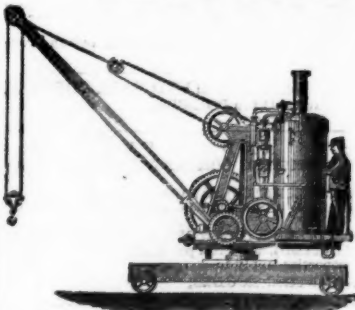
PORTABLE or FIXED, for WHARF or RAIL, to hoist 15 cwt. to 30 tons. Geared to hoist or lower, and turn entirely round in either direction by the steam power, separately or simultaneously, as required.

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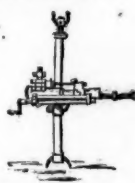
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THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Prtd.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
10000 Caron, <i>t</i> , Cardigan	2 0 0	2 1 2	1 1 2	0 4 0	0 2 0	Oct. 1878
10000 Carn Brea, <i>c</i> , <i>t</i> , Illogan	56 7 6	72 1 2	75 8 0	308 3 0	1 0 0	Feb. 1874
10400 Devon Gt. Consols, <i>c</i> , <i>t</i> , Tavistock	1 0 0	12 1 2	12 1 2	117 13 0	0 10 0	May 1880
4236 Dolcoath, <i>c</i> , <i>t</i> , Camborne	10 14 10	53 5 5	53 5 5	117 11 3	1 10 0	June 1880
6400 East Pool, <i>c</i> , <i>t</i> , Illogan	0 9 9	34 3 5	35 3 5	19 15 3	1 2 6	June 1880
40000 Ghas. Car., <i>c</i> , <i>t</i> , 10000 sh. pd.	1 1 1	1 1 1	1 1 1	0 13 10	0 0 6	Aug. 1878
2500 Gossard and Merilyn Con., <i>t</i> , Flint	2 10 0	2 2 2	2 2 2	0 5 0	0 5 0	Aug. 1877
15000 Great Laxey, <i>t</i> , Isle of Man	4 0 0	19 1 2	18 1 2	26 2 0	0 8 0	July 1880
8400 Green Hurst, <i>t</i> , Durham	0 6 0	6 6 6	6 6 6	2 10 0	0 5 0	Mar. 1880
20000 Grosvenor, <i>t</i> , Cardigan	2 0 0	3 3 3	3 3 3	0 14 10	0 10 0	Aug. 1878
2800 Isle of Man, <i>t</i> , Isle of Man	25 0 0	—	—	82 5 0	0 10 0	Feb. 1879
20000 Lerdhills, <i>t</i> , Lanarkshire	6 0 0	3 3 3	3 3 3	0 15 0	0 0 3	Mar. 1878
400 Lisburn, <i>t</i> , Cardigan	48 15 0	37 1 2	35 3 4	601 10 0	1 0 0	June 1880
10000 Mellanor, <i>c</i> , Hayle	2 0 0	5 5 5	5 5 5	0 13 6	0 2 6	July 1880
9000 Minera Mining Co., <i>t</i> , Wrexham	5 0 0	11 1 2	11 1 2	68 13 2	0 4 0	May 1880
20000 Mining Co. of Ireland, <i>c</i> , <i>t</i> , <i>t</i>	7 0 0	2 2 2	2 2 2	24 0 0	0 2 6	Jan. 1880
8000 Mona, <i>c</i> , Anglesea	5 0 0	15 1 5	15 1 5	0 10 0	0 10 0	July 1880
5328 North Busy, <i>c</i> , Chacewater	0 5 8	1 1 1	1 1 1	0 3 4	0 4 0	Oct. 1878
11829 North Hendre, <i>t</i> , Wales	2 10 0	—	—	3 10 0	0 7 6	Mar. 1880
8063 Ditto	1 0 0	—	—	0 7 0	0 3 0	Mar. 1880
6000 Pennant, <i>t</i> , North Wales	5 0 0	3 3 3	3 3 3	0 10 0	0 5 0	Mar. 1878
12000 Phoenix United, <i>c</i> , <i>t</i> , Link	5 10 3	4 4 4	4 4 4	0 2 6	0 2 6	Mar. 1880
18000 P. Patrick, <i>c</i> , <i>t</i> , (als. 12000 pf. 10 p.c.)	1 0 0	—	—	0 18 6	0 2 6	July 1880
10000 Red Rock, <i>t</i> , Cardigan	2 0 0	1 1 1	1 1 1	0 4 0	0 2 0	Apr. 1878
12000 Roman Gravel, <i>t</i> , Salop	7 10 0	11 1 1	10 1 1	8 1 0	0 5 0	Apr. 1880
4000 Rhydyalon, <i>t</i> , Wales	10 0 0	—	—	0 5 0	0 5 0	Feb. 1880
512 South Caradon, <i>c</i> , St. Cleer	1 5 0	100 85 95	749 0 0	1 0 0	0 1 0	July 1880
6123 South Condurrow, <i>c</i> , <i>t</i> , Camborne	6 5 6	10 10 10	10 10 10	7 2 0	0 10 0	Apr. 1880
9000 South Darren, <i>t</i> , Cardigan	1 10 0	3 2 3	3 2 3	0 4 0	0 2 0	Apr. 1880
4500 South Wheat Flances, <i>c</i> , Illogan	7 12 4	14 1 2	13 14 x d.	40 15 6	0 10 0	July 1880
12000 Tankerville, <i>t</i> , Salop	6 0 0	4 4 4	4 4 4	4 17 6	0 5 0	Jan. 1877
12000 Tintoff, <i>c</i> , <i>t</i> , Foot, Illogan	11 10 0	17 1 2	17 1 2	50 8 6	0 5 0	May 1877
15000 Van, <i>t</i> , Llandidies	15 0 0	21 1 1	18 1 1	24 18 0	0 7 6	July 1880
3000 West Whitford, <i>t</i> , Penryn	15 15 0	3 3 3	3 3 3	55 10 0	0 10 0	Feb. 1878
512 West Tolgar, <i>c</i> , Redruth	35 10 0	21 1 1	21 1 1	33 0 0	1 0 0	Jan. 1879
12000 West Wheat Seton, <i>c</i> , Camborne	25 10 0	21 1 1	21 1 1	0 7 6	0 7 6	Apr. 1878
12000 Wheel Crebor, <i>c</i> , Tavistock	2 4 0	6 5 6	6 5 6	0 6 3	0 2 6	July 1880
1024 Wheel Eliza Consols, <i>t</i> , St. Austell	18 0 0	—	—	34 10 0	0 4 0	May 1880
4295 Wheel Killy, <i>t</i> , St. Agnes	5 4 6	5 5 5	5 5 5	12 14 6	0 5 0	May 1880
3000 Wheel Peavor, <i>t</i> , Redruth	7 11 0	29 1 2	30 1 2	5 6 0	1 5 0	June 1880

FOREIGN DIVIDEND MINES.

Shares.	Prtd.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
35500 Alamos, <i>t</i> , Spain	2 0 0	1 1 1	1 1 1	2 0 9	0 1 0	Apr. 1880
130000 Almaden and Tinto Consol., <i>t</i> , Spain	1 0 0	—	—	0 6 3	0 1 0	May 1876
20000 Australian, <i>c</i> , South Australia	7 7 0	1 1 1	1 1 1	1 3 6	0 2 6	Aug. 1879
20000 Cape Copper Mining, <i>t</i> , South Africa	7 0 0	40 38 40	38 7 0	1 0 0	1 0 0	June 1880
35000 Cesena Sulph. Co., Romagna, Italy	16 0 0	—	—	1 1 0	0 1 0	Aug. 1879
10000 Copiapo, <i>c</i> , Chile (2500 shares)	17 0 0	9 7 1 2	8 1 2	7 14 5	0 3 0	July 1880
23500 Eberhardt and Aurora, <i>c</i> , Nevada	10 0 0	3 2 3	2 3 3	1 8 0	0 3 0	Dec. 1877
70000 English and Australian, <i>c</i> , <i>t</i> , St. Aust.	2 10 0	1 1 1	1 1 1	2 18 9	0 1 0	Mar. 1880
25000 Fortuna, <i>t</i> , Spain	2 0 0	5 4 5	7 11 5	0 5 0	0 5 0	Apr. 1880
55000 Frontino and Bolivia, <i>c</i> , New Gran.	2 0 0	3 3 3	3 3 3	0 5 0	0 1 6	June 1880
15000 Linares, <i>t</i> , Spain	3 0 0	6 5 6	18 12 10	0 8 0	0 8 0	Apr. 1880
10000 Pontgibaud, <i>c</i> , France	20 0 0	20 18 20	27 17 6	0 10 0	0 9 0	Dec. 1879
100000 Port Phillip, <i>c</i> , Clunes (25 shares)	1 0 0	3 3 3	1 13 4	0 1 4	0 1 4	Mar. 1880
54000 Richmond Consol., <i>c</i> , Nevada	5 0 0	16 1 2	15 1 2	9 1 6	0 10 0	June 1880
185880 Rio Tinto, <i>c</i> , Sp. Comp. Bds., Huella	100 0 0	94 95	93 95	5 per cent.	—	Jan. 1880
44125 Ditto, Mortgage Bonds	20 0 0	—	—	7 per cent. per ann.	—	Jan. 1880
225000 Ditto, shares	10 0 0	12 1 2	12 1 2	0 10 0	0 10 0	Apr. 1880
40000 Santa Barbara, <i>c</i> , Brazil	0 10 0	2 1 2	2 1 2	0 10 0	0 2 0	Apr. 1880
120000 Scottish-Australian Mining Co., <i>t</i> , N. Z.	1 0 0	2 2 2	2 2 2	15 p. cent.	—	May 1880
80000 Soudan, <i>c</i> , <i>t</i> , Argentina	1 0 0	1 1 1	1 1 1	15 p. cent.	—	May 1880
22500 Sierra Buttes, <i>c</i> , California	2 0 0	1 1 1	1 1 1	0 2 0	0 2 0	Jan. 1880
40825 Ditto, Plumas Eureka	2 0 0	2 2 2	2 2 2	0 2 0	0 1 6	Apr. 1879
253000 St. John del Rey (25 Stock and multiples dealt in)	220 230	—	—	12 1 2	0 3 0	for half-year, June 1879
20000 Tolima, <i>c</i> , Colombia	5 0 0	—	—	1 3 0	0 4 0	Mar. 1880
25000 Victoria (London), <i>c</i> , Australia	1 0 0	—	—	0 13 1 2	0 7 6	July 1879
2100 W. Prussian (5000 pref. sh. £10 pd.)	10 0 0	10 10 10	10 10 10	2 10 0	0 8 0	Apr. 1880

Have made calls since last dividend was paid.

NON-DIVIDEND BRITISH MINES.

Shares.	Prtd.	Last wk.	Clos. pr.
25000 Berillyn, <i>c</i> , <i>t</i> , Carnarvon	5 0 0	1 1 1	1 1 1
12000 Assheton, <i>c</i> , Carnarvonshire	5 0 0	—	—
11583 Bedford Unit, <i>c</i> , <i>t</i> , Tavis (21 lab.)	0 4 0	—	—
25000 Belovada, <i>c</i> , <i>t</i> , Roches	1 0 0	1 1 1	1 1 1
600 Bendigald, <i>c</i> , <i>t</i> , Wales	10 0 0	13 12 13	12 13
30000 Bettw-y-Coed, <i>c</i> , <i>t</i> , (20000 sh. issued)	1 0 0	—	—
8000 Blaen Caelan, <i>c</i> , <i>t</i> , Cardigan	3 0 0	—	—
3939 Blue Hills, <i>c</i> , <i>t</i> , St. Agnes	4 6 6	4 1 2	4 1 2
30000 Bodidris, <i>c</i> , <i>t</i> , Denbighshire	1 0 0	1 1 1	1 1 1
200 Botallack, <i>c</i> , <i>t</i> , St. Just	126 5 0	20 18 20	18 20
10000 British, <i>c</i> , <i>t</i> , Wrexham	2 0 0	3 2 3	3 2 3
2000 Bwch United, <i>c</i> , <i>t</i> , (21 sh.) Cardigan	0 12 6	—	—
50000 Cambrian, <i>c</i> , <i>t</i> , <i>t</i> , Cardigan	2 0 0	2 1 2	2 1 2
6000 Carr Camborne, <i>c</i> , <i>t</i> , Camborne	0 2 6	2 1 2	2 1 2
20000 Carnarvon, <i>c</i> , <i>t</i> , Carnarvonshire	1 0 0	1 1 1	1 1 1
5120 Clementina, <i>c</i> , <i>t</i> , Llanrwst	1 0 0	1 1 1	1 1 1
25000 Coed Mawr Pool, <i>c</i> , <i>t</i> , Carnarvon	2 0 0	—	—
2450 Cook's Kitchen, <i>c</i> , <i>t</i> , Illogan	23 14 9	8 7 3 8	7 3 8
15500 Court Grange United, <i>c</i> , <i>t</i> , <i>t</i>	0 17 6	3 1 2	3 1 2
6400 Crook Burn, <i>c</i> , <i>t</i> , Cumberland	0 5 0	—	—
14000 Crosswood Mining Lands, <i>c</i> , <i>t</i> , <i>t</i>	1 0 0	1 1 1	1 1 1
15000 Cwm Dyfford, <i>c</i> , <i>t</i> , Carnarvon	1 0 0	—	—
12000 Cwm Fry, <i>c</i> , <i>t</i> , (20000 sh. issued)	1 0 0	—	—
2000 D'Essey Consols, <i>c</i> , <i>t</i> , Carnarvon	10 0 0	—	—
1024 D'Essey Mountain, <i>c</i> , <i>t</i> , Llanrwst	20 0 0	—	—
20000 Denbighshire Consolidated, <i>c</i> , <i>t</i>	3 0 0	3 2 3	3 2 3
12000 Derwent, <i>c</i> , <i>t</i> , Durham	4 0 0	2 1 2	2 1 2
100000 Devon, <i>c</i> , <i>t</i> , <i>t</i> , Tavistock (125000 iss.)	0 1 0	—	—
12000 Devon Great United (21)	1 0 0	1 1 1	1 1 1
20000 Devonshire, <i>c</i> , <i>t</i> , <i>t</i> , Lydford	1 0 0	1 1 1	1 1 1
100000 Dobby Syke, <i>c</i> , <i>t</i> , Durham	0 17 6	3 1 2	3 1 2
6000 East Botallack, <i>c</i> , <i>t</i> , St. Just	0 2 6	1 1 1	1 1 1
6144 East Caradon, <i>c</i> , <i>t</i> , St. Cleer	3 0 0	1 1 1	1 1 1
4000 East Chiverton, <i>c</i> , <i>t</i> , Penryn	9 10 3	1 1 1	1 1 1
3000 East Craven Moor, <i>c</i> , <i>t</i> , Pateley Bldg.	10 0 0	9 8 9	8 9
12000 East Crebor, <i>c</i> , <i>t</i> , Tavistock	0 4 0	1 1 1	1 1 1
15000 East Devon Consols, <i>c</i> , <i>t</i> , Buckfast	2 0 0	2 1 2	2 1 2
30000 East Florida, <i>c</i> , <i>t</i> , Cardigan	1 0 0	1 1 1	1 1 1
10000 East Longstone, <i>c</i> , <i>t</i> , Lezant	1 0 0	—	—
21000 East Roman Gravel, <i>c</i> , <i>t</i> , Salop	0 10 0	—	—
10000 East Van, <i>c</i> , <i>t</i> , Llandidies	0 10 0	2 1 2	2 1 2
4098 East Wheel Hall, <i>c</i> , <i>t</i> , Gwennap	0 10 0	—	—
1114 East Wheel Lovell, <i>c</i> , <i>t</i> , Helston	13 8 6	1 1 1	1 1 1
30000 Flintshire Great Consols	1 0 0	1 1 1	1 1 1
10000 Fortescue, <i>c</i> , <i>t</i> , St. Stephen	1 0 0	2 1 2	2 1 2
12500 Frongoch, <i>c</i> , <i>t</i> , Cardigan (10000 sh. iss.)	2 0 0	3 1 2	3 1 2
3950 Gwanton, <i>c</i> , <i>t</i> , Tavistock	4 0 0	—	—
14000 Glenroy, <i>c</i> , <i>t</i> , Isle of Man	4 0 0	1 1 1	1 1 1
20000 Great Dyfford (10000 sh. issued)	1 0 0	—	—
20000 Gt. E. Foxdale, <i>c</i> , <i>t</i> , <i>t</i> , (21 sh.)	0 18 0	5 4 5	4 5
12000 Great Holway, <i>c</i> , <i>t</i> , <i>t</i> , Flintshire	5 0 0	—	—
6000 Great W. Eleanor, <i>c</i> , <i>t</i> , North Bovey	1 0 0	—	—
20000 Griffin, <i>c</i> , <i>t</i> , <i>t</i> , Carnarvon	3 0 0	3 1 2	3 1 2
9380 Gunnslake (Clitters), <i>c</i> , <i>t</i> , <i>t</i>	5 0 0	3 1 2	3 1 2
10000 Gwyn-y-Mynydd, <i>c</i> , <i>t</i> , <i>t</i> , Flintshire	4 0 0	4 1 2	4 1 2
10000 Harehope Gill, <i>c</i> , <i>t</i> , Durham (21 sh.)	0 5 0	—	—
1200 Hartington Moor, <i>c</i> , <i>t</i> , <i>t</i> , Derby	1 1 0	1 1 1	1 1 1
6400 Harwood, <i>c</i> , <i>t</i> , Durham	0 15 0	—	—
3000 Herodsfoot, <i>c</i> , <i>t</i> , near Liskeard	1 0 0	3 1 2	3 1 2
18000 Hingston Down, <i>c</i> , <i>t</i> , Calstock	0 10 0	—	—
10000 Killfret, <i>c</i> , <i>t</i> , Chacewater	3 10 0	—	—
30000 Lady Ashburton, <i>c</i> , <i>t</i> , Callington	1 0 0	3 1 2	3 1 2
15000 Lady Bertha, <i>c</i> , <i>t</i> , Tavistock	0 10 0	—	—
12000 Ladywell, <i>c</i> , <i>t</i> , Salop (12000 pref. also)	2 10 0	—	—
5000 Lead Era, <i>c</i> , <i>t</i> , Mold	2 10 0	—	—
25000 Levant, <i>c</i> , <i>t</i> , St. Just	11 0 0	—	—
10000 Lomax, <i>c</i> , <i>t</i> , Helston	1 0 0	1 1 1	1 1 1
5120 Lovell, <i>c</i> , <i>t</i> , Wendron	0 16 0	1 1 1	1 1 1
30000 Llanrwst, <i>c</i> , <i>t</i> , Carnarvon	2 0 0	1 1 1	1 1 1
10000 Ditto, 10 per cent. pref.	0 10 0	—	—
9000 Marke Valley, <i>c</i> , <i>t</i> , Llaninhorne	5 11 0	2 1 2	2 1 2
10000 Mawston, <i>c</i> , <i>t</i> , South Wales	1 0 0	1 1 1	1 1 1
6000 Medlyn Moor, <i>c</i> , <i>t</i> , Wendron	3 15 0	—	—
28000 Mid-Devon, <i>c</i> , <i>t</i> , (17000 sh. 4d. pd.)	0 6 8	3 1 2	3 1 2
8000 Mineral Corporation of Gt. Britain	10 0 0	—	—
20000 Mostyn Consols, <i>c</i> , <i>t</i> , <i>t</i> , Flint	1 0 0	1 1 1	1 1 1
10000 Mynydd Gwddol, <i>c</i> , <i>t</i> , Cardigan	3 0 0	—	—
10000 Monay Firth (18000 issued)	0 2 0	—	—
12000 Moria D., <i>c</i> , <i>t</i> , Anglesea	1 0 0	1 1 1	1 1 1
6144 Mount Carbis, <i>c</i> , <i>t</i> , Redruth	0 10 0	1 1 1	1 1 1
4678 New Bronfild, <i>c</i> , <i>t</i> , Cardigan (25 sh.)	3 16 0	—	—
12000 New Cathedral, <i>c</i> , <i>t</i> , Gwennap	1 0 0	—	—
2400 New Cook's Kitchen, <i>c</i> , <i>t</i> , Illogan	7 0 0	8 1 2	8 1 2
8000 New Dolcoath, <i>c</i> , <i>t</i> , Camborne	3 0 0	—	—

NON-DIVIDEND MINES.

Shares.	Prtd.	Last wk.	Clos. pr.
6000 New Kitty, <i>c</i> , <i>t</i> , St. Agnes	10 0 0	—	—
10000 New Llanfair, <i>c</i> , <i>t</i> , Carnarvon	10 0 0	—	—
12000 New Penrose, <i>c</i> , <i>t</i> , <i>t</i> , Helston (11 sh.)	0 10 0	—	—
3000 New Wheel Peavor, <i>c</i> , <i>t</i> , Redruth	0 10 0	—	—
3500 New Tincroft, <i>c</i> , <i>t</i> , Lelant	0 10 0	—	—
35000 New Wye Valley, <i>c</i> , <i>t</i> , Montgomery	0 10 0	—	—
10000 N. D'Essey Mount, <i>c</i> , <i>t</i> , <i>t</i> , Carnarvon	1 0 0	—	—